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BURLINGTON ENVIRONMENTAL

September 9, 1993

CERTIFIED MAIL

FILE COPY

RECEIVED
SEP 13 1993
RCRA PERMITS SECTION

Mr. David Croxton
EPA Project Coordinator
U.S. EPA
1200 Sixth Avenue, M/S HW-106
Seattle, WA 98101

Mr. Croxton:

Attached is the Bimonthly Progress Report required by the 3008(h) Order for RFI activities completed at the Burlington Environmental Inc. Pier 91 Facility for the months of July and August 1993.

If you have any questions or require further information, please contact me at (206) 654-8153.

Sincerely,

John Stiller
Project Coordinator

cc: Barb Smith, Ecology NWRO

USEPA RCRA
3012355

Burlington Environmental Inc.
Waterfront Place One • Suite 700 • 1011 Western Avenue • Seattle, WA 98104
(206) 223-0500 • FAX: (206) 654-8164

MEMORANDUM

RECEIVED
SEP 9 1993
BURLINGTON ENVIRONMENTAL, INC.
CORPORATE OFFICE

DATE: September 9, 1993

TO: John Stiller

FROM: Joe Depner JD

CC: Gary Podrabsky
Nate Mathews
Dave Haddock

SUBJECT: RFI BIMONTHLY PROGRESS REPORT, PIER 91 FACILITY (JULY TO AUGUST 1993)

This memorandum summarizes the progress of the Burlington Environmental Inc. (Burlington) Pier 91 RCRA facility investigation (RFI), from July 1 to August 31, 1993. This is the seventh bimonthly progress report for the Pier 91 RFI. The RCRA 3008(h) order for the facility requires that progress reports be submitted bimonthly until the order is terminated.

DESCRIPTION AND ESTIMATE OF WORK COMPLETED

The following work was completed during the reporting period:

- Fluid levels in monitoring wells at the facility were measured twice; once during July and once during August.
- A land survey of the Pier 91 facility was performed. The survey results are expected to be delivered to Burlington during early September.
- Work continued on the draft RFI report.
- Pressure buildups and combustible gas levels of wellhead exhaust from monitoring wells CP-106B, CP-115B and CP-122B were checked.
- Most of the laboratory data reports for the July 1993 quarterly groundwater sampling event were received and the data have been validated.
- Laboratory analysis results from the April 1993 groundwater sampling event were entered into Burlington's database management system (GIS/Key). Efforts to enter the laboratory analysis results for soil samples collected during previous investigations began.

- A meeting and numerous telephone discussions were held with representatives of USEPA, to discuss the details of pending RFI Work Plan variance requests submitted earlier by Burlington.

- A data package was compiled and submitted to the USEPA, in support of a work plan variance request involving well MW-39-3 and proposed well CP-120.

- The proposed decommissioning procedure for temporary shallow piezometer CP-122A was revised, and a description of the procedure was submitted to the USEPA.

- Efforts to answer the interim corrective measures justification questions presented in the RFI Work Plan continued.

SUMMARY OF ALL FINDINGS

Attached are copies of the laboratory data reports for the groundwater samples collected during the April 1993 groundwater sampling event.

Burlington has learned that the deep water-supply well north of Cold Storage Building W-39, and approximately due west of the pipe alley at the Burlington Pier 91 facility, was sampled on May 3, 1993. The results of the analyses, which are attached, were made available to Burlington by representatives of the Seattle Water Department.

No pressure buildup was observed in well CP-122B during the August water-level measurement effort, while the buildup in well CP-106B was observed to be slight and that of well CP-115B was moderate. These observations seem to support the hypothesis that the pressure buildups in these wells are decreasing with time. Combustible gas indicator (CGI) readings of wellhead exhaust ranged from 14 to 114 percent of the lower explosive limit (%LEL) in well CP-122B, from 25 to 392 %LEL in well CP-106B, and from 43 to 340 %LEL in well CP-115B. CGI readings of wellhead exhaust generally decreased with time, to less than 100 %LEL, within approximately 1.5 hour of wellhead venting. The CGI was calibrated with pentane.

PROJECTED WORK FOR THE NEXT REPORTING PERIOD

The following activities are projected for the next reporting period, which is from September 1 to October 31, 1993:

- Fluid levels in the monitoring wells will be measured monthly.
- The next quarterly round of groundwater sampling will be performed in the early part of October 1993.
- The data from the March tidal monitoring field session will be analyzed and the results will be included in the draft RFI report.
- Contour maps of monthly water levels will be compiled and submitted to USEPA in early September
- The QA/QC review of the chemical analysis results for the July 1993 quarterly groundwater sampling event is expected to be completed during the first week of September 1993. The results will be entered into the GIS.
- Burlington's response to the interim measures justification questions presented in the Pier 91 RFI Work Plan will be compiled and submitted to the USEPA by September 27.
- The draft RFI report will be submitted to the USEPA by October 25.

Please contact me if you have any questions about the above information.

Attachments

JSD/g:\users\beckyk\2439.mem

Date: May 6, 1993

RECEIVED
AUG 18 1993
Burlington Environmental Inc.
Technical Services

To: Brian Spindor, SWD Engineering

From: Brian Hoyt, Water Quality Lab.

Subject: Pier 91 Well Analysis and Comments

The test parameters were chosen to provide the most information with the least labor and expense because of the very preliminary stage of this investigation. More extensive testing would be necessary if preliminary analysis of yield/aquifer drawdown, well head protection, and water quality data looked favorable. Based on this set of sample results it doesn't look like a source SWD should be pursuing for integration into our system.

The test results indicate a low hardness, moderately alkaline water with high levels of conductivity (TDS), sodium, chloride, ultra violet absorbance (organics), phosphate and ammonia-Nitrogen. The following table indicates the probable treatment or dilution needed to make this water compatible with present Seattle water:

Problem Constituent	Problem Caused	Probable Action Required
S.Conductance	TDS inconsistancy for industrial users	Dilution: 20% well/ 80% Cedar (to maintain S.C. below 2X normal level)
Sodium	Dietary source of Na should stay below 20mg/L	Dilution: 14% well/ 86% Cedar (@ Na = 15mg/L, assumes NaOCl dosage of 18mg/L is needed)
Chloride	Increased corrosivity	Dilution: unknown ratio (to keep sulfate + halide/ alkalinity ratio < 1.0)
U.V. Abs.	DBP precursors & corrosivity increases	Dilution: 5% well/ 95% Cedar (to maintain DPB's below projected new regulations)
Phosphates	Algae growth and bacteria re-growth stimulant	Dilution: 2% well/ 98% Cedar (to keep P below 0.1 mg/L)
Ammonia-N	High chlorine dosage requirement (high cost)	Chlorine dosage needed to oxidize NH3 and provide purely free Cl2 residual without odor problems = 18 mg/L.

In summary, the water Quality problems presented here should preclude further consideration of this source as an addition to the Seattle system. When looking at possible ground waters for supplemental supplies, it is best to assume that suitable pipelines or reservoirs in which consistent blending can be accomplished will be needed.

Please call if you have any questions regarding the interpretation of these test results.

(Samples Collected 5/3/93)

Parameter	Result
T. Alkalinity	152 mg/L as $CaCO_3$
Hardness	35.4 mg/L " "
pH	8.19
Spec. Conductance	400 micromhos/cm
Ortho PO_4-P	4. mg/L (screening test)
Iron	0.1 mg/L (" ")
Fluoride	0.27 mg/L
Chloride	30. mg/L(screening test)
Sodium	77. mg/L(" ")
Odor character	sulfite/sulfide
Diss. Oxygen	0.8 mg/L
U.V. Abs.	1.286 / 5cm @ 254nm
Turbidity	0.3 NTU
NH_3-N	1.7 mg/L (screening test)
NO_3+NO_2-N	<0.1 mg/L (" ")
Het. Plate Count	5 cfu/mL
Coliform	Absent

cc: Bob Schwartz
Rich Donner
Darrell Reimer
Jan Martin
Sarah Miller

PROJECT MEMORANDUM

DATE: July 21, 1993
TO: Joe Depner, Hydrogeologist
FROM: Nels Cone, Chemist
PROJECT: Burlington Pier 91 RFI
Project Number 624878
SUBJECT: VALIDATION OF GROUNDWATER ANALYTICAL RESULTS DATA SETS 10A-10C

On April 4, 1993, four water samples were collected by Burlington Environmental Inc. personnel. These samples were submitted to Sound Analytical Services of Tacoma, Washington for volatile organic (EPA SW-846 Method 8240), semivolatile organic (EPA SW-846 Method 8270), and Total Petroleum Hydrocarbon (EPA SW-846 Methods 418.1 and 8015 Modified) analyses (work order 31234). I performed a review of the analytical results for the samples listed below.

CP-104A-0493 CP-104B-0493 CP-105A-0493 CP-105B-0493

A properly completed chain-of-custody form was included (6319). The sample was shown as having been properly iced and received in good condition. Holding times were evaluated according to regulatory protocol (*National Functional Guidelines for Organic Data Review*, USEPA, 1990). The sample received the analyses required by the Quality Assurance Project Plan (QAPP), and laboratory extraction/analysis times met the established guidelines. Proper data qualifier flags were used by the laboratory with the exceptions noted below.

Data Set 10A:

For volatile analyses, the holding times met USEPA requirements. The method blank contained methylene chloride and acetone; results received the proper "B" data qualifier flag as needed. All surrogate recoveries were within required quality control (QC) limits. Matrix spike/matrix spike duplicate analyses demonstrated appropriate analytical accuracy and relative percent differences (RPD) between the two analyses indicate acceptable analytical precision. Supporting QC documentation included bromofluorobenzene tuning data, continuing calibration verification, and sample chromatograms. Data consistency was demonstrated throughout.

Data Set 10B:

The holding times for semivolatile analyses met USEPA requirements. Di-n-butylphthalate, di-n-octylphthalate and bis(2-ethylhexyl)phthalate appear as laboratory contaminants; results for these analytes did not always receive the required "B" data qualifier flag. Surrogate recoveries for the sample were within QC limits. Matrix spike/matrix spike duplicate (MS/MSD) analyses were within established QC limits. The RPDs indicate acceptable analytical precision.

Supporting QC documentation included decafluorotriphenylphosphine tuning data, continuing calibration verification and sample chromatograms. Data consistency was demonstrated throughout.

Data Set 10C:

Results from Total Petroleum Hydrocarbon analyses indicate that holding times for this sample satisfied USEPA requirements. Surrogate recoveries were within required QC limits. Duplicate analyses were performed, and appropriate analytical precision is displayed. Matrix spike analyses indicate required analytical accuracy was achieved. The method blank analysis results met required QC criteria and no corrections were needed. Supporting QC documentation included continuing calibration curves along with sample, spike and method blank chromatograms. Data consistency was demonstrated throughout.

RECOMMENDATIONS

In order to satisfy the data quality objectives as defined in Table F-2 of the QAPP, the following actions should be taken. All reported detections of di-n-butylphthalate, di-n-octylphthalate and bis(2-ethylhexyl)phthalate should receive "B" data qualifier flags. This data set can then be considered valid for its intended use.

PROJECT MEMORANDUM

DATE: July 21, 1993
TO: Joe Depner, Hydrogeologist
FROM: Nels Cone, Chemist
PROJECT: Burlington Pier 91 RFI
Project Number 624878
SUBJECT: VALIDATION OF GROUNDWATER ANALYTICAL RESULTS DATA SETS 11A-11D

During the period of April 6-14, 1993 twenty-eight water samples were collected by Burlington Environmental Inc. personnel. These samples were submitted to Sound Analytical Services of Tacoma, Washington for volatile organic (EPA SW-846 Method 8240), semivolatile organic (EPA SW-846 Method 8270, material density (Standard Method 213E) and Total Petroleum Hydrocarbon (EPA SW-846 Methods 418.1 and 8015 Modified, and WDOE Method WTPH-HCID) analyses (work orders 31280, 31308, 31340, 31367, 31409, 31428, and 31448). I performed a review of the analytical results for the samples listed below.

CP-W10-0493	CP-108A-0493	CP-113-0493	CP-117-0493
CP-39-3-0493	CP-108B-0493	CP-114-0493	CP-118-0493
CP-103A-0493	CP-109-0493	CP-115A-0493	CP-119-0493
CP-105A-0493	CP-109M-0493	CP-115B-0493	CP-121-0493
CP-106A-0493	CP-110-0493	CP-115M-0493	CP-122B-0493
CP-106B-0493	CP-111-0493	CP-116-0493	CP-911-0493
CP-107-0493	CP-112-0493	CP-116M-0493	CP-915A-0493

Properly completed chain-of-custody forms were included (numbers 6225, 6322, 6323, 6325, 6287, 6326, and 6327). The samples were shown as having been properly iced/refrigerated and received in good condition. Holding times were evaluated according to regulatory protocol (*National Functional Guidelines for Organic Data Review,* USEPA, 1990). The samples received the analyses required by the Quality Assurance Project Plan (QAPP), with all field holding and laboratory extraction/analysis times meeting the established guidelines. Proper data qualifier flags were used by the laboratory with the exceptions noted below. Field duplicate results indicate that appropriate analytical precision was achieved for all analyses.

Data Set 11A:

For volatile analysis, all sample holding times met USEPA guidelines. The method blanks contained methylene chloride, acetone, and toluene; results did not always receive the required "B" data qualifier flag. Trip blank results were consistent with those of the laboratory method blank. All surrogate recoveries were within required quality control (QC) limits. Matrix spike/matrix spike duplicate analyses demonstrated appropriate analytical accuracy. Several samples required dilution, resulting in

a corresponding increase in reported quantitation limits (PQLs). Supporting QC documentation in the form of bromofluorabenzene tuning data and continuing calibration verification was provided.

Data Set 11B:

Holding times for semivolatile analyses of all samples satisfied USEPA requirements. Both di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected as laboratory contaminants; results for these analytes did not always receive the required "B" data qualifier flag. Surrogate recoveries for all samples were within QC limits except when samples received significant dilution specifically samples CP-115A-0493 and CP-117-0493. This dilution also resulted in elevated PQLs for these samples. Matrix spike/matrix spike duplicate analyses display analytical accuracy within QC limits with the exception of 1,4-dichlorobenzene and 1,2,4-trichlorobenzene. Overall, analytical accuracy remains intact because these analytes were not detected in the samples and the RPDs between these two results indicate acceptable analytical precision. Supporting QC documentation in the form of decafluorotriphenylphosphine tuning data and continuing calibration verification was provided.

Data Set 11C:

Holding times for Total Petroleum Hydrocarbon analyses of all samples satisfied USEPA requirements. Surrogate recoveries were within required QC limits, except as expected when samples being analyzed were actual product. Results from duplicate analyses displayed appropriate analytical precision. Matrix spike analyses indicate required analytical accuracy was achieved. The method blank analyses results met required QC criteria and no corrections were needed. Additional QC documentation in the form of laboratory check standards and initial and continuing calibration verification has been provided.

Data Set 11D:

Holding times for all samples satisfied USEPA requirements. Method blank analyses met required QC criteria and no corrections were needed. Duplicate analyses results indicate appropriate analytical precision was achieved. Laboratory check standard results display analytical accuracy within QC limits.

RECOMMENDATIONS:

In order to satisfy the data quality objectives as defined in Table F-2 of the QAPP, the following actions should be taken. All reported detections of methylene chloride and acetone should receive "B" data qualifier flags. All reported detections of di-n-butylphthalate and bis(2-ethylhexyl)phthalate should receive "B" data qualifier flags. These data can then be considered valid for their intended use.

PROJECT MEMORANDUM

DATE: July 26, 1993
TO: Joe Depner, Hydrogeologist
FROM: Nels Cone, Chemist
PROJECT: Burlington Pier 91 RFI
Project Number 624878
SUBJECT: VALIDATION OF GROUNDWATER ANALYTICAL RESULTS DATA SETS 10D-10E

During the period of April 5 to 14, 1993, thirty-two water samples were collected by Burlington Environmental field personnel. These samples were submitted to Burlington Corporate Laboratory for metals analysis (EPA SW-846 Methods 3010, 6010 and 7000 series) and PCB analysis (EPA SW-846 Method 8080), (work orders 46052, 46076, 46115, 46145, 46175, 46209, 46245 and 46278). I performed a review of the analytical results for the following samples:

CP-W10-0493	CP-106A-0493	CP-111-0493	CP-116M-0493
CP-39-3-0493	CP-106B-0493	CP-112-0493	CP-117-0493
CP-103A-0493	CP-107-0493	CP-113-0493	CP-118-0493
CP-103B-0493	CP-108A-0493	CP-114-0493	CP-119-0493
CP-104A-0493	CP-108B-0493	CP-115A-0493	CP-121-0493
CP-104B-0493	CP-109-0493	CP-115B-0493	CP-122B-0493
CP-105A-0493	CP-109M-0493	CP-115M-0493	CP-911-0493
CP-105B-0493	CP-110-0493	CP-116-0493	CP-915A-0493

Findings

Properly completed chain-of-custody forms were included (numbers 6330, 6224, 6328, 6324, 6320, 6321, 6277 and 6286). The samples were shown as having been properly iced and received in good condition. All holding times were evaluated according to regulatory protocol (*National Functional Guidelines for Organic (and Inorganic) Data Review*, USEPA, 1991). The samples received the analyses required by the Quality Assurance Project Plan (QAPP), and laboratory extraction/analysis times met the established guidelines. Field duplicate results indicate that appropriate analytical precision was achieved.

10D

For metal analysis, matrix spike/matrix spike duplicate results displayed analytical accuracy within USEPA guidelines. Method blank data were within quality control (QC) limits. All laboratory control samples, initial calibration verification, and continuing calibration verification data met requisite criteria for analytical precision.

10E

Surrogate recoveries for all PCB analyses were within QC limits with the exception of tetrachloro-m-xylene (TCMX) recovery for sample CP-122B-0493; overall, the data remain unaffected. When samples required dilution, a corresponding increase in reported quantitation limts (PQLs) was noted. All method blank data met QC criteria. Matrix spike/matrix spike duplicate results satisfied QC criteria for analytical accuracy. Continuing calibration verification provided further demonstration of analytical precision. The data quality objectives as defined in Table F-2 of the QAPP are met. Proper data qualifiers were used by the laboratory as needed.

Recommedations

These data can be considered valid for their intended use.

BURLINGTON ENVIRONMENTAL

RECEIVED

MAY 1 0 1993

Burlington Environmental Inc.
Technical Services

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46209

Dear Joe:

Two water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 13, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batchs. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46209-1,2, M04143-4, and B04143-4	AALA	4/14/93	4/15/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure

BURLINGTON ENVIRONMENTAL

BURLINGTON ENVIRONMENTAL

General Laboratory Report

Lab Number : 46209

Plant/Generator Name : Pier 91; Project #624878 TASK 7306
Sample Type : Groundwater; CP-121, -110
Date of Receipt : 04/13/93 Analyst: BLW,BB,EL,DKW
Date of Report : 05/10/93 QC Checked: Kathy Riepe
Parameters for Analysis: PCBs, Total and Dissolved Metals
Outside Lab : None Outside Lab Report No:

Data:

These two groundwater samples from the Pier 91 Project #624878 Task 7306, sample numbers CP-121-0493 and CP-110-0493 were analyzed for PCBs by Method 8080 and for Total and Dissolved Metals by Methods 7000 and 6010. Copies of all results are attached.

Comments and Conclusions:

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6321

PROJECT NAME PIER 91
PROJECT NUMBER 62 4878 MAJOR TASK 7306
SAMPLERS L. LaROSA, A. LaJOIE
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE # ~~LOCATION~~	NO. OF CONTAINERS	TYPE OF ANALYSIS: TOTAL METALS	DISSOLVED METALS	PCB					ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
46209-1	4-12-93	1111		✓	CP-121-0493	4	1	1	2					✓	✓	
-2	4-12-93	1530		✓	CP-110-0493	4	1	1	2					✓	✓	

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
Louis A. LaRosa	4-13-93	0810	Katey Oehler	4-13	8:12

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

PCB Laboratory Report Page 1

Lab Number : 46209

Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/13/93 Analyst: BLW,BB,EL,DKW
Date of Report : 04/29/93 QC Checked: 5/3/93
Outside Lab : NONE Outside Lab Report No:
Number of Samples : 5

Run #	Sample ID	Code Numbers	# Drums in Composite	Aroclor #	Total PCB (ppm)
AALA46	B04143-4	BLANK			<0.1ppb
AALA45	M04143-4	METHOD SPIKE		1248	135%
AALA40	46209-1	CP-121-0493			<0.1ppb
AALA41	46209-2	CP-110-0493			<0.1ppb
AALA37	CCV	5 PPM CCV (111%)		1248	5.58
AALA48	CCV	5 PPM CCV (112%)		1254	5.61

Instrument: Hewlett Packard 5890 G.C.
Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46209

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/13/93 Analyst: BLW, BB, EL
Date of Report : 04/27/93 QC Checked: 4/27/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46209-1 TOTAL CP-121-0493	46209-1 DISS. CP-121-0493	46209-2 TOTAL CP-110-0493	46209-2 DISS. CP-110-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.
ATES ANALYZED: 4/14/93, 4/15/93, 4/20/93, 4/22/93
/26/93, 4/27/93.

Metals Laboratory Report

Lab Number : 46209

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/13/93 Analyst: BLW, BB, EL
Date of Report : 04/27/93 QC Checked: 4/27/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46209-2 MS % RECOVERY	46209-2 MSD % RECOVERY	% RECOVERY ICV
Silver	101.8	101.8	
Arsenic	91.8	92.2	109.2
Barium	99.7	99.0	
Beryllium	102.2	101.6	
Cadmium	99.8	99.6	
Chromium	99.8	99.6	
Copper	100.1	99.8	
Mercury	98.1	94.5	101.0
Nickel	99.8	99.3	
Lead	94.0	93.5	91.5
Selenium	102.6	101.6	105.5
Zinc	102.0	102.1	

Comments and Conclusions:

RESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46209Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/13/93 Analyst: BLW, BB, EL
Date of Report : 04/27/93 QC Checked: 4/27/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	PREPARATION BLANK MG/L	CONTROL SAMPLE % RECOVERY	% RECOVERY CCV	CCV
Silver	<0.010	96.5	103.0	100.8
Arsenic	<0.010	87.2	97.7	95.2
Barium	<0.20	98.6	101.2	99.6
Beryllium	<0.005	106.0	99.9	98.6
Cadmium	<0.005	109.2	100.3	101.0
Chromium	<0.010	105.0	100.5	101.1
Copper	<0.025	101.2	100.3	100.8
Mercury	<0.0002	101.7	74.4	
Nickel	<0.040	108.0	104.8	104.4
Lead	<0.003	90.5	96.8	
Selenium	<0.005	108.3	100.5	
Zinc	<0.020	109.8	99.2	99.8

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L AND PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46209Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/13/93 Analyst: BLW, ~~BB~~, EL
Date of Report : 04/27/93 QC Checked: 4/27/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	% RECOVERY
Metals:	CCV
Arsenic	92.8

Comments and Conclusions:

RESULTS ARE REPORTED IN PERCENT RECOVERY.

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6321

PROJECT NAME PCB '93
PROJECT NUMBER 62487B
MAJOR TASK 7306
SAMPLERS L. LaRosa, A. LaJoie
LAB DESTINATION BET

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE # ~~LOCATION~~	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Metals	Dissolved Metals	PCB					ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
46209-1	4-12-93	1111		J	CP-121-0493	4	1	1	2					✓	✓	
-2	4-12-93	1530		✓	CP-110-0493	4	1	1	2					✓	✓	

RELINQUISHED BY	SIGNATURE	DATE	TIME	RECEIVED BY	SIGNATURE	DATE	TIME
Louis A. LaJoie	Louis A. LaJoie	4-13-93	0810	Katey Oehler	Katey Oehler	4-13	8:12

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

12

BURLINGTON ENVIRONMENTAL

RECEIVED

MAY 10 1993

Burlington Environmental Inc.
Technical Services

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46052

Dear Joe:

Four water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 05, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batchs. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46052-4, M04083-1, and B04083-1	AAKZ	4/08/93	4/13/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure

BURLINGTON ENVIRONMENTAL

BURLINGTON ENVIRONMENTAL

General Laboratory Report

Lab Number : 46052

Plant/Generator Name : Pier 91; Project #624878 Task 7203
Sample Type : Groundwater; CP-105B, -105A, -104B, -104A
Date of Receipt : 04/05/93 Analyst: BB,EL,JLB,DKW
Date of Report : 05/07/93 QC Checked: Kathy Krepps
Parameters for Analysis: Total and Dissolved Metals, PCBs
Outside Lab : None Outside Lab Report No:

Data:

These water samples from the Pier 91 Project #624878, Task 7203, sample numbers CP-105B-0493, CP-105A-0493, CP-104B-0493, CP-104A-0493, were analyzed for Total and Dissolved Metals by EPA Methods 7000 and 6010 and for PCBs by EPA Method 8080. Copies of the results are attached.

Comments and Conclusions:

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6330

PROJECT NAME PIER 91
PROJECT NUMBER 624878 MAJOR TASK 7603
SAMPLERS L. LaRosa, K. Walter, D. Braden
LAB DESTINATION IEA

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: TOTAL METALS	DISSOLVED METALS	PCB					PRESERVATIVES: ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
46052-1	4-5-93	1115		✓	CP105B-0493	2	1	1						✓	✓	
46052-2	4-5-93	1305		✓	CP105A-0493	2	1	1						✓	✓	
46052-3	4-5-93	1500		✓	CP104B-0493	2	1	1						✓	✓	
46052-4	4-5-93	1557		✓	CP104A-0493	4	1	1	2					✓	✓	

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
Louis A LaRosa III	4-5-93	1700	Kathy Kreps	4/5/93	1700

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

PCB Laboratory Report Page 1

Lab Number : 46052

Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7203
Sample Type : GROUNDWATER
Date of Receipt : 04/05/93 Analyst: BB,EL,JLB,DKW
Date of Report : 04/29/93 QC Checked: 5/3/93
Outside Lab : NONE Outside Lab Report No:
Number of Samples :

Run #	Sample ID	Code Numbers	# Drums in Composite	Aroclor #	Total PCB (ppm)
AAKZ40	46052-4	CP104A-0493			<1.0ppb
AAKZ41	CCV	5 PPM CCV (111%)		1254	5.56
AAKZ30	CCV	5 PPM CCV (111%)		1248	5.56
AAKZ27	B04083-1	BLANK			<0.1ppb
AAKZ26	M04083-1	METHOD SPIKE		1248	135%
AAKZ19	CCV	5 PPM CCV (89%)		1254	4.46

Instrument: Hewlett Packard 5890 G.C.
Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46052

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7203
Sample Type : GROUNDWATER
Date of Receipt : 04/05/93 Analyst: BB, EL, JLB
Date of Report : 04/16/93 QC Checked: [illegible] 4/16/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46052-1 TOTAL CP-105B-0493	46052-1 DISS. CP-105B-0493	46052-2 TOTAL CP-105A-0493	46052-2 DISS. CP-105A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	0.054	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.
ATES ANALYZED: 4/9/93, 4/12/93, 4/13/93, 4/14/93.

Metals Laboratory Report

Lab Number : 46052

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7203
Sample Type : GROUNDWATER
Date of Receipt : 04/05/93 Analyst: BB, EL, JLB
Date of Report : 04/16/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46052-3 TOTAL CP-104B-0494	46052-3 DISS. CP-104B-0494	46052-4 TOTAL CP-104A-0494	46052-4 DISS. CP-104A-0494
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.

Metals Laboratory Report

Lab Number : 46052Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7203
Sample Type : GROUNDWATER
Date of Receipt : 04/05/93 Analyst: BB, EL, JLB
Date of Report : 04/16/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	PREPARATION BLANK (MG/L)	CONTROL SAMPLE % RECOVERY	46052-2 MS % RECOVERY	46052-2 MSD % RECOVERY
Silver	<0.010	75.7	102.0	84.2
Arsenic	<0.010	92.5	100.0	102.5
Barium	<0.20	105.7	101.6	107.0
Beryllium	<0.005	106.6	103.2	109.4
Cadmium	<0.005	99.5	94.4	97.4
Chromium	<0.010	99.3	96.4	99.8
Copper	<0.025	106.3	103.0	106.6
Mercury	<0.0002	102.4	103.8	103.8
Nickel	<0.040	102.8	97.7	101.8
Lead	<0.003	103.0	88.0	89.5
Selenium	<0.005	106.3	118.2	109.0
Zinc	<0.020	106.4	100.5	107.1

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L AND PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46052Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7203
Sample Type : GROUNDWATER
Date of Receipt : 04/05/93 Analyst: BB, EL, JLB
Date of Report : 04/16/93 QC Checked: 4/16/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	% RECOVERY			
Metals:	ICV	ICV	CCV	CCV
Silver			102.1	102.0
Arsenic	108.4	101.9	93.1	96.7
Barium			104.9	103.9
Beryllium			99.9	99.5
Cadmium			94.1	94.5
Chromium			96.4	97.0
Copper			102.9	103.0
Mercury	96.3			
Nickel			98.5	103.3
Lead	93.7		99.6	98.0
Selenium	97.5		104.8	90.1
Zinc			99.0	97.9

Comments and Conclusions:

RESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46052Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7203
Sample Type : GROUNDWATER
Date of Receipt : 04/05/93 Analyst: BB, EL, JLB
Date of Report : 04/16/93 QC Checked: 4/16/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	% RECOVERY		
Metals:	CCV	CCV	CCV
Arsenic	99.2	93.2	92.8
Lead	95.6		
Selenium	92.8	90.8	

Comments and Conclusions:

ESULTS ARE REPORTED IN PERCENT RECOVERY.

BURLINGTON ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 0330

PROJECT NAME: PIER 91
PROJECT NUMBER: 624878 MAJOR TASK: 7003
SAMPLERS: L. LaRosa, K. Walter, D. Brewen
LAB DESTINATION: BEF

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: TOTAL METALS	DISSOLVED METALS	PCB					PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
46052-1	4-5-93	1115		✓	CP105B-0493	2	1	1						✓	✓	
46052-2	4-5-93	1305		✓	CP105A-0493	2	1	1						✓	✓	
46052-3	4-5-93	1500		✓	CP104B-0493	2	1	1						✓	✓	
46052-4	4-5-93	1557		✓	CP104A-0493	4	1	1	2					✓	✓	

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
Louis H LaRosa BEF	4-5-93	1700	Kathy Kreps	4/5/93	1700

SHIPPING NOTES

LAB NOTES

BURLINGTON ENVIRONMENTAL

RECEIVED

MAY 1 0 1993

Burlington Environmental Inc.
Technical Services

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46115

Dear Joe:

Five water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 7, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batchs. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46115-1,2,3,4,5, M04083-1, and B04083-1	AAKZ, CAFX	4/08/93	4/12/93, 4/27/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure

BURLINGTON ENVIRONMENTAL

General Laboratory Report

Lab Number : 46115

Plant/Generator Name : Pier 91; Project #624878 Task 7306
Sample Type : Groundwater; CP-111, -911, -113, -114, -112
Date of Receipt : 04/07/93 Analyst: BB,EL,JLB,DKW
Date of Report : 05/07/93 QC Checked: Kathy Krieps
Parameters for Analysis: Total and Dissolved Metals, PCBs
Outside Lab : None Outside Lab Report No:

Data:

These water samples from Pier 91 Project #624878, Task 7306, sample numbers CP-111-0493, CP-911-0493, CP-113-0493, CP-114-0493, CP-112-0493 were analyzed for Total and Dissolved Metals by Methods 7000 and 6010 and PCBs by Methods 8080. Copies of the results are attached.

Comments and Conclusions:

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6328

PROJECT NAME PIER 91
PROJECT NUMBER 024878 MAJOR TASK 7306
SAMPLERS L. LaRosa, G. Wood
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: TOTAL METALS	DISSOLVED METALS	PCB					ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
46115-1	4-7-93	1015		✓	CP-111-0493	4	1	1	2					✓	✓	HANG FOR METALS
46115-2	4-7-93	1015		✓	CP-911-0493	4	1	1	2					✓	✓	
46115-3	4-7-93	1200		✓	CP-113-0493	4	1	1	2					✓	✓	
46115-4	4-7-93	1400		✓	CP-114-0493	4	1	1	2					✓	✓	
46115-5	4-7-93	1530		✓	CP-112-0493	4	1	1	2					✓	✓	

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
Louis A LaRosa III	4-7-93	1645	Kathy Knepp	4/7/93	1700

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

PCB Laboratory Report

Lab Number : 46115

Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/07/93 Analyst: BB,EL,JLB,DKW
Date of Report : 04/29/93 QC Checked: 5/3/93
Outside Lab : NONE Outside Lab Report No:
Number of Samples :

Run #	Sample ID	Code Numbers	# Drums in Composite	Aroclor #	Total PCB (ppm)
AAKZ27	B04083-1	BLANK			<0.1ppb
AAKX26	M04083-1	METHOD SPIKE		1248	135%
CAFX21	46115-1	CP-111-0493			<50ppb
CAFX22	46115-2	CP-911-0493			<50ppb
AAKZ22	46115-3	CP-113-0493			<0.1ppb
AAKZ23	46115-4	CP-114-0493			<0.1ppb
AAKZ24	46115-5	CP-112-0493			<0.1ppb
AAKZ19	CCV	5 PPM CCV (89%)		1254	4.46
AAKZ30	CCV	5 PPM CCV (111%)		1248	5.57
CAFX15	CCV	5 PPM CCV (101%)		1248	5.04
CAFX26	CCV	5 PPM CCV (110%)		1248	5.49

Instruments: Hewlett Packard 5890 and 5890 Series II G.C.s
Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46115

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/07/93 Analyst: BB, EL, JLB
Date of Report : 04/20/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46115-1 TOTAL CP-111-0493	46115-1 DISS. CP-111-0493	46115-2 TOTAL CP-911-0493	46115-2 DISS. CP-911-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.
ATES ANALYZED: 4/14/93, 4/15/93, 4/16/93, 4/19/93

Metals Laboratory Report

Lab Number : 46115

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/07/93 Analyst: BB, EL, JLB
Date of Report : 04/20/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46115-3 TOTAL CP-113-0493	46115-3 DISS. CP-113-0493	46115-4 TOTAL CP-114-0493	46115-4 DISS. CP-114-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

Metals Laboratory Report

Lab Number : 46115

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/07/93 Analyst: BB, EL, JLB
Date of Report : 04/20/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46115-5 TOTAL CP-112-0493	46115-5 DISS. CP-112-0493	46115-1 MS % RECOVERY	46115-1 MSD % RECOVERY
Silver	<0.010	<0.010		
Arsenic	<0.010	<0.010	85.0	87.5
Barium	<0.20	<0.20		
Beryllium	<0.005	<0.005		
Cadmium	<0.005	<0.005		
Chromium	<0.010	<0.010		
Copper	<0.025	<0.025		
Mercury	<0.0002	<0.0002	103.0*	99.5*
Nickel	<0.040	<0.040		
Lead	<0.003	<0.003	85.0	71.5
Selenium	<0.005	<0.005	80.0	50.0
Zinc	<0.020	<0.020		

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.
MERCURY SPIKES PERFORMED ON 46115-4.

Metals Laboratory Report

Lab Number : 46115

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/07/93 Analyst: BB, ~~EL~~, JLB
Date of Report : 04/20/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab-Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46115-3 MS % RECOVERY	36115-3 MSD % RECOVERY
Silver	104.2	97.2
Barium	95.4	97.7
Beryllium	102.0	107.4
Cadmium	100.0	107.2
Chromium	100.0	102.8
Copper	98.2	100.7
Nickel	100.0	104.6
Zinc	103.5	108.7

Comments and Conclusions:

RESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46115Q

Plant/Generator Name : PIER 91 Pj 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/07/93 Analyst: BB, EL, JLB
Date of Report : 04/20/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	PREPARATION BLANK MG/L	CONTROL SAMPLE % RECOVERY	% RECOVERY ICV
Silver	<0.010	96.5	
Arsenic	<0.010	95.0	105.2
Barium	<0.20	98.6	
Beryllium	<0.005	106.0	
Cadmium	<0.005	109.2	
Chromium	<0.010	105.0	
Copper	<0.025	101.2	
Mercury	<0.0002	103.5	92.4
Nickel	<0.040	108.0	
Lead	<0.003	98.5	94.5
Selenium	<0.005	88.5	102.4
Zinc	<0.020	109.8	

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L AND PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46115Q

Plant/Generator Name : PIER 91 Pj 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/07/93 Analyst: BB, EL, JLB
Date of Report : 04/20/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	% RECOVERY			
Metals:	CCV	CCV	CCV	CCV
Silver	101.0	100.4		
Arsenic	92.5	100.8	102.4	108.8
Barium	97.5	94.6		
Beryllium	98.7	96.8		
Cadmium	102.2	101.1		
Chromium	101.7	99.4		
Copper	99.4	98.0		
Mercury	103.5	108.6		
Nickel	101.6	100.2		
Lead	104.8	97.6	109.6	106.4
Selenium	96.4	105.6	90.8	94.4
Zinc	100.3	99.7		

Comments and Conclusions:

RESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46115Q

Plant/Generator Name : PIER 91 Pj 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/07/93 Analyst: BB, EL, JLB
Date of Report : 04/20/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	% RECOVERY		
Metals:	CCV	CCV	CCV
Arsenic	97.2		
Lead	102.0	101.2	100.0
Selenium	95.2		

Comments and Conclusions:

:SULTS ARE REPORTED IN PERCENT RECOVERY.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 3

PROJECT NAME PIER 91
PROJECT NUMBER C24878 MAJOR TASK 7306
SAMPLERS L. LaRosa, G. Wood
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: TOTAL METALS	DISSOLVED METALS	PCB					PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
46115-1	4-7-93	1015		✓	CP-111-0493	4	1	1	2					✓	✓	HNO3 FOR METALS
46115-2	4-7-93	1015		✓	CP-911-0493	4	1	1	2					✓	✓	
46115-3	4-7-93	1200		✓	CP-113-0493	4	1	1	2					✓	✓	
46115-4	4-7-93	1400		✓	CP-114-0493	4	1	1	2					✓	✓	
46115-5	4-7-93	1530		✓	CP-112-0493	4	1	1	2					✓	✓	

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
Louis A LaRosa III	4-7-93	1645	Kathy Kreps	4/7/93	1700

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

BURLINGTON
ENVIRONMENTAL

RECEIVED
MAY 10 1993
Burlington Environmental Inc.
Technical Services

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46076

Dear Joe:

Four water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 6, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batchs. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46076-2, M04083-1, and B04083-1	AAKZ, CAFX	4/08/93	4/12/93, 4/27/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure

BURLINGTON
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ENVIRONMENTAL

General Laboratory Report

Lab Number : 46076

Plant/Generator Name : Pier 91; Project #624878 TASK 7306
Sample Type : Groundwater; CP-108-B, -108-A, -103-B, -103-A
Date of Receipt : 04/06/93 Analyst: BB,EL,JLB,DKW
Date of Report : 05/10/93 QC Checked: [signature]
Parameters for Analysis: PCBs, Total and Dissolved Metals
Outside Lab : None Outside Lab Report No:

Data:

These four groundwater samples from the Pier 91 Project #624878, Task 7306, sample numbers CP-108-B-0493, CP-108-A-0493, CP-103-B-0493, CP-103-A-0493 were analyzed for PCBs by Method 8080 and for Total and Dissolved Metals by Methods 7000 and 6010. Copies of the results are attached.

Comments and Conclusions:

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6224

PROJECT NAME BEI Pier 91
PROJECT NUMBER 624878 MAJOR TASK 7306
SAMPLERS Ken Walter
LAB DESTINATION Burlington Env. Corp.

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: PCB	Total Metals	Dissolved Metals					PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
46076-1	4-6-93	0900			CP-108-B-0493	2		✓	✓					✓		
46076-2	4-6-93	1130			CP-108-A-0493	~~3~~ 4	✓	✓	✓					✓		
46076-3	4-6-93	1310			CP-103-B-0493	2		✓	✓					✓		
46076-4	4-6-93	1510			CP-103-A-0493	2		✓	✓					✓		

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
	4-6-93	1700		4/6/93	1700

SHIPPING NOTES Hand Delivered By Ken Walter

LAB NOTES

BE-34 (1/92)

PCB Laboratory Report

Lab Number : 46076

Plant/Generator Name : / PIER 91 Pj#624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/06/93 Analyst: BB,EL,JLB,DKW
Date of Report : 04/29/93 QC Checked: 5/3/93
Outside Lab : NONE Outside Lab Report No:
Number of Samples :

Run #	Sample ID	Code Numbers	# Drums in Composite	Aroclor #	Total PCB (ppm)
AAKZ27	B04083-1	BLANK			<0.1ppb
AAKZ26	M04083-1	METHOD SPIKE		1248	135%
CAFX23	46076-2	CP-108-A-0493			<10ppb
AAKZ19	CCV	5 PPM CCV (89%)		1254	4.46
AAKZ30	CCV	5 PPM CCV (111%)		1248	5.57
CAFX15	CCV	5 PPM CCV (101%)		1248	5.04
CAFX26	CCV	5 PPM CCV (110%)		1248	5.49

Instruments: Hewlett Packard 5890 and 5890 Series II G.C.s
Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46076

Plant/Generator Name : PIER 91 Pj#624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/06/93 Analyst: BB, EL, JLB
Date of Report : 04/19/93 QC Checked: 4/19/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46076-1 TOTAL CP-108-B-0493	46076-1 DISS. CP-108-B-0493	46076-2 TOTAL CP-108-A-0493	46076-2 DISS. CP-108-A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	0.011	0.011	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.
ATES ANALYZED: 4/13/93, 4/14/93, 4/15/93, 4/16/93
/19/93.

Metals Laboratory Report

Lab Number : 46076

Plant/Generator Name : PIER 91 Pj#624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/06/93 Analyst: BB, EL, JLB
Date of Report : 04/19/93 QC Checked: 4/19/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46076-3 TOTAL CP-103-B-0493	46076-3 DISS. CP-103-B-0493	46076-4 TOTAL CP-103-A-0493	46076-4 DISS. CP-103-A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.

Metals Laboratory Report

Lab Number : 46076

Plant/Generator Name : PIER 91 Pj#624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/06/93 Analyst: BB, EL, ULB
Date of Report : 04/19/93 QC Checked: 4/19/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46076-2 MS % RECOVERY	46076-2 MSD % RECOVERY	46076-3 MS % RECOVERY	46076-3 MSD % RECOVERY
Silver	98.6	43.0		
Arsenic			102.5	105.0
Barium	103.6	105.4		
Beryllium	103.2	107.2		
Cadmium	94.0	98.6		
Chromium	98.4	98.4		
Copper	102.6	104.0		
Mercury			92.2	95.6
Nickel	97.2	100.7		
Lead			89.5	96.5
Selenium			88.1	89.2
Zinc	100.1	105.0		

Comments and Conclusions:

ESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46076Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/06/93 Analyst: BB, ~~EL~~, JLB
Date of Report : 04/19/93 QC Checked: 4/19/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	PREPARATION BLANK MG/L	CONTROL SAMPLE % RECOVERY	ICV % RECOVERY	ICV % RECOVERY
Silver	<0.010	75.7		
Arsenic	<0.010	95.0	105.2	102.8
Barium	<0.20	105.7		
Beryllium	<0.005	106.6		
Cadmium	<0.005	99.5		
Chromium	<0.010	99.3		
Copper	<0.025	106.3		
Mercury	<0.0002	97.5		
Nickel	<0.040	102.8		
Lead	<0.003	98.5	94.5	
Selenium	<0.005	88.5	102.4	94.4
Zinc	<0.020	106.4		

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L AND PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46076Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/06/93 Analyst: BB, EL, JLB
Date of Report : 04/19/93 QC Checked: 4/19/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	% RECOVERY			
Metals:	CCV	CCV	CCV	CCV
Silver	102.0	102.9		
Arsenic	100.0	95.2	100.8	102.4
Barium	103.9	105.3		
Beryllium	99.5	99.9		
Cadmium	94.5	93.2		
Chromium	97.0	96.7		
Copper	103.0	104.6		
Nickel	103.3	98.0		
Lead	104.8	97.6	109.6	106.4
Selenium	96.4	105.6	106.8	90.8
Zinc	97.9	97.7		

Comments and Conclusions:

RESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46076Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/06/93 Analyst: BB, ~~EL~~, JLB
Date of Report : 04/19/93 QC Checked: 4/19/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	% RECOVERY
Metals:	CCV
Lead	102.0
Selenium	94.4

Comments and Conclusions:

ESULTS ARE REPORTED IN PERCENT RECOVERY.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO _____

PROJECT NAME BEI Pier 91
PROJECT NUMBER 62-4878 MAJOR TASK 7306
SAMPLERS Ken Walter
LAB DESTINATION Burlington Env. Corp.

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: PCB	Total Metals	Dissolved Metals	PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
16076-1	4-6-93	0900			CP-108-B-0493	2		✓	✓	✓		
16076-2	4-6-93	1130			CP-108-A-0493	~~3~~ 4	✓	✓	✓	✓		
16076-3	4-6-93	1310			CP-103-B-0493	2		✓	✓	✓		
16076-4	4-6-93	1510			CP-103-A-0493	2		✓	✓	✓		

RELINQUISHED BY: SIGNATURE	DATE	TIME	RECEIVED BY: SIGNATURE	DATE	TIME
[signature]	4-6-93	1700	[signature]	4/6/93	1700

SHIPPING NOTES Hand Delivered By Ken Walter

LAB NOTES

BE-34 (1/92)

BURLINGTON ENVIRONMENTAL

RECEIVED

MAY 10 1993

Burlington Environmental Inc.
Technical Services

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46278

Dear Joe:

Six water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 15, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batchs. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%, except for 46278-6MS which had a TCMX surrogate recovery of 185%.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46278-1,2,3,3MS,3MSD, 4,5,6,6MS,6MSD, and B04153-1	AALB, DAFV and DAFX	4/15/93 and 4/23/93	4/19/93, 4/23/93 and 4/27/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure

BURLINGTON ENVIRONMENTAL

General Laboratory Report

Lab Number : 46278

Plant/Generator Name : Pier 91; Project #624878 Task 7306
Sample Type : Groundwater; CP-W10, -109M, -109, -116M, -116, -39
Date of Receipt : 04/15/93 Analyst: BLW,BB,EL,DKW
Date of Report : 05/07/93 QC Checked: Kathy Kapp
Parameters for Analysis: Total and Dissolved Metals, PCBs
Outside Lab : None Outside Lab Report No:

Data:

These water samples from the Pier 91 Project #624878, Task 7306, sample numbers CP-W10-0493, CP-109M-0493, CP-109-0493, CP-116M-0493, CP-116-0493, CP-39-3-0493 were analyzed for Total and Dissolved Metals by Method 7000 and 6010 and PCBs by Method 8080. Copies of the results are attached.

Comments and Conclusions:

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6286

PROJECT NAME Pier 91
PROJECT NUMBER 6.2-1575 MAJOR TASK 7300
SAMPLERS L. LaRosa
LAB DESTINATION BEI

	SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: TOTAL METALS	DISSOLVED METALS	PCB	MS/MSD				PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
-1	46276	4.14.93	0930		✓	CP-W10-0493	4	1	1	2					✓	✓	
-2	~~46279~~	4.14.93	1030		✓	CP-109M-0493	4	1	1	2					✓	✓	
-3	~~46280~~	4.14.93	1030		✓	CP-109-0493	4	1	1	2					✓	✓	
-4	~~46281~~	4.14.93	1300		✓	CP-116M-0493	4	1	1	2					✓	✓	
-5	~~4628~~	4.14.93	1415		✓	CP-116-0493	4	1	1	2					✓	✓	
-6		4.14.93	1730		✓	CP-39-3-0493	7	1	1	2	3				✓	✓	

RELINQUISHED BY

SIGNATURE	DATE	TIME

RECEIVED BY

SIGNATURE	DATE	TIME
[signature]	4/15/93	0801

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

PCB Laboratory Report Page 1

Lab Number : 46278

Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/15/93 Analyst: BLW,BB,EL,DKW
Date of Report : 04/29/93 QC Checked: 4/29/93
Outside Lab : NONE Outside Lab Report No:
Number of Samples : 4

Run #	Sample ID	Code Numbers	# Drums in Composite	Aroclor #	Total PCB (ppm)
AALB29	B04153-1	BLANK			<0.1ppb
AALB20	46278-1	CP-W10-0493			<0.1ppb
AALB21	46278-2	CP-109M-0493			<0.1ppb
AALB22	46278-3	CP-109-0493			<0.1ppb
DAFV108	46278-3M	MATRIX SPIKE		1248	120%
DAFV109	46278-3M	MATRIX SPIKE DUPLICATE(RSD=4%)		1248	125%
AALB23	46278-4	CP-116M-0493			<0.1ppb
DAFX73	46278-5	CP-116-0493			<50ppb
AALB25	46278-6	CP-39-3-0493			<0.1ppb
AALB27	46278-6M	METHOD SPIKE SAMPLE CONCENTRATED DUE TO EVAPORATION OF SOLVENT IN VIAL WITH LOOSE CAP.		1248	305%
AALB28	46278-6M	METHOD SPIKE DUPE (RSD=81%)		1248	130%
AALB15	CCV	5 PPM CCV (113%)		1248	5.63
AALB26	CCV	5 PPM CCV (113%)		1254	5.66
AALB37	CCV	5 PPM CCV (113%)		1248	5.64
DAFV100	CCV	5 PPM CCV (99%)		1248	4.97
DAFV110	CCV	5 PPM CCV (110%)		1248	5.49
DAFX65	CCV	5 PPM CCV (91%)		1248	4.55
DAFX76	CCV	5 PPM CCV (111%)		1248	5.56

Instruments: Hewlett Packard 5890 and 5890 Series II G.C.s
Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46278

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/15/93 Analyst: BLW, BB, EL
Date of Report : 04/29/93 QC Checked: 4/30/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No: '

METALS BY SW-846 3010, 6010, 7000.

Metals:	46278-1 TOTAL CP-W10-0493	46278-1 DISS. CP-W10-0493	46278-2 TOTAL CP-109M-0493	46278-2 DISS. CP-109M-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.
ATES ANALYZED: 4/16/93, 4/26/93, 4/27/93, 4/28/93

Metals Laboratory Report

Lab Number : 46278

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/15/93 Analyst: BLW, BB, EL
Date of Report : 04/29/93 QC Checked: 4/29/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No: '

METALS BY SW-846 3010, 6010, 7000.

Metals:	46278-3 TOTAL CP-109-0493	46278-3 DISS. CP-109-0493	46278-4 TOTAL CP-116M-0493	46278-4 DISS. CP-116M-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.

Metals Laboratory Report

Lab Number : 46278

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/15/93 Analyst: BLW, BB, EL
Date of Report : 04/29/93 QC Checked: 4/23/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No: '

METALS BY SW-846 3010, 6010, 7000.

Metals:	46278-5 TOTAL CP-116-0493	46278-5 DISS. CP-116-0493	46278-6 TOTAL CP-39-3-0493	46278-6 DISS. CP-39-3-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	0.004	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.

Metals Laboratory Report

Lab Number : 46278Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/15/93 Analyst: BLW, BB, EL
Date of Report : 04/29/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46278-2 MS % RECOVERY	46278-2 MSD % RECOVERY	46278-6 MS % RECOVERY	46278-6 MSD % RECOVERY
Silver	104.8	102.8	101.4	101.8
Arsenic	98.2	99.4		
Barium	100.8	100.7	98.4	98.8
Beryllium	100.6	100.6	102.6	102.4
Cadmium	101.4	100.4	99.0	99.2
Chromium	101.6	102.4	100.4	99.2
Copper	102.1	101.4	100.0	100.1
Mercury	99.1	95.3		
Nickel	104.3	103.4	100.9	99.8
Lead	103.5	102.5		
Selenium	107.4	104.7		
Zinc	101.9	101.5	101.5	102.3

Comments and Conclusions:

RESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46278Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/15/93 Analyst: BLW, BB, EL
Date of Report : 04/29/93 QC Checked: 4/30/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	PREPARATION BLANK MG/L	CONTROL SAMPLE % RECOVERY	% RECOVERY ICV	ICV
Silver	<0.010	105.1	96.2	
Arsenic	<0.010	102.0	98.4	
Barium	<0.20	99.2	99.5	
Beryllium	<0.005	100.2	99.6	
Cadmium	<0.005	102.3	99.3	
Chromium	<0.010	103.7	100.0	
Copper	<0.025	102.4	99.4	
Mercury	<0.0002	91.5	93.9	
Nickel	<0.040	103.3	101.2	
Lead	<0.003	103.0	95.3	97.3
Selenium	<0.005	117.6	105.5	
Zinc	<0.020	105.5	99.4	

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L AND PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46278Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/15/93 Analyst: BLW, BB, EL
Date of Report : 04/29/93 QC Checked: 4/30/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	% RECOVERY CCV	CCV	CCV	CCV
Silver	100.6	101.0		
Arsenic	104.9	105.9	108.6	
Barium	99.9	99.7		
Beryllium	99.9	99.2		
Cadmium	100.5	100.2		
Chromium	100.7	99.0		
Copper	101.5	101.4		
Mercury	84.7	92.6		
Nickel	103.3	102.6		
Lead	102.8	100.0	99.2	101.2
Selenium	100.5	101.0	101.7	99.1
Zinc	99.5	100.5		

Comments and Conclusions:

RESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46278Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/15/93 Analyst: BLW, BB, EL
Date of Report : 04/29/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	% RECOVERY CCV
Lead	99.2

Comments and Conclusions:

ESULTS ARE REPORTED IN PERCENT RECOVERY.

BURLINGTON ENVIRONMENTAL

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. ____

PROJECT NAME: Pier 91
PROJECT NUMBER: 62-1878
MAJOR TASK: 7306
SAMPLERS: C. LaRosa
LAB DESTINATION: PEI

	SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	Total Metals	Dissolved Metals	PCB	MS/MSD				ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
-1	46278	4.14.93	0930		✓	CP-W10-0493	4	1	1	2					✓	✓	
-2	46279	4.14.93	1030		✓	CP-109M-0493	4	1	1	2					✓	✓	
-3	46280	4.14.93	1030		✓	CP-109-0493	4	1	1	2					✓	✓	
-4	46281	4.14.93	1300		✓	CP-116M-0493	4	1	1	2					✓	✓	
-5	4628	4.14.93	1415		✓	CP-116-0493	4	1	1	2	3				✓	✓	
-6		4.14.93	1730		✓	CP-39-3-0493	7	1	1	2							

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			[signature]	4/15/93	0801

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

BURLINGTON ENVIRONMENTAL

RECEIVED
MAY 10 1993
Burlington Environmental Inc.
Technical Services

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46145

Dear Joe:

Two water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 8, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report.

The analyst(s) name(s) and the instrument used for each analyte are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure

BURLINGTON ENVIRONMENTAL

General Laboratory Report

Lab Number : 46145

Plant/Generator Name : Pier 91; Project #624878 TASK 7306
Sample Type : Groundwater; CP-107-0493 and CP-106A-0493
Date of Receipt : 04/08/93 Analyst: BLW, BB, EL
Date of Report : 05/10/93 QC Checked:
Parameters for Analysis: Total and Dissolved Metals
Outside Lab : None Outside Lab Report No:

Data:

These two groundwater samples from the Pier 91 Project #624878, Task 7306, sample numbers CP-107-0493 and CP-106A-0493, were analyzed for Total and Dissolved Metals by Methods 7000 and 6010. Copies of the results are attached.

Comments and Conclusions:

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6320

PROJECT NAME Pier 91
PROJECT NUMBER 624878 MAJOR TASK 7306
SAMPLERS L. LaRosa, D. Broten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE ~~LOCATION~~ #	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Metals	Dissolved Metals						PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
461-5-1	4/8/93	1230		✓	CP-107-0493	2	1	1						✓	✓	
-2	4/8/93	1445		✓	CP-106A-0493	2	1	1						✓	✓	

RELINQUISHED BY

SIGNATURE	DATE	TIME
David Broten	4-8-93	16:30

RECEIVED BY

SIGNATURE	DATE	TIME
[signature]	4/8/93	4:30 pm

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

Metals Laboratory Report

Lab Number : 46145

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/08/93 Analyst: BLW, BB, EL
Date of Report : 04/23/93 QC Checked: 4/23/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46145-1 TOTAL CP-107-0493	46145-1 DISS. CP-107-0493	46145-2 TOTAL CP-106A-0493	46145-2 DISS. CP-106A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.
DATES ANALYZED: 4/14/93, 4/20/93, 4/21/93, 4/22/93

Metals Laboratory Report

Lab Number : 46145

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/08/93 Analyst: BLW, BB, EL
Date of Report : 04/23/93 QC Checked: 4/27/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46145-1MS % RECOVERY	46145-1 MSD % RECOVERY
Silver	93.8	101.6
Arsenic	91.5	91.6
Barium	98.6	96.5
Beryllium	108.0	103.2
Cadmium	106.8	100.8
Chromium	104.4	101.2
Copper	103.0	98.6
Mercury	105.4	109.0
Nickel	104.7	101.3
Lead	91.0	88.5
Selenium	92.6	82.1
Zinc	112.7	105.8

Comments and Conclusions:

RESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46145Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/08/93 Analyst: BLW, BB, EL
Date of Report : 04/23/93 QC Checked: 4/27/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	PREPARATION BLANK MG/L	CONTROL SAMPLE % RECOVERY	% RECOVERY ICV
Silver	<0.010	96.5	
Arsenic	<0.010	87.2	109.2
Barium	<0.20	98.6	
Beryllium	<0.005	106.0	
Cadmium	<0.005	109.2	
Chromium	<0.010	105.0	
Copper	<0.025	101.2	
Mercury	<0.0002	94.7	94.7
Nickel	<0.040	108.0	
Lead	<0.003	90.5	102.0
Selenium	<0.005	108.3	94.4
Zinc	<0.020	109.8	

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L AND PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46145Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/08/93 Analyst: BLW, BB, EL
Date of Report : 04/23/93 QC Checked: 4/23/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	% RECOVERY		
Metals:	CCV	CCV	CCV
Silver	101.3	100.2	
Arsenic	94.3	97.7	95.2
Barium	96.1	96.3	
Beryllium	99.0	98.4	
Cadmium	103.5	101.5	
Chromium	101.0	101.7	
Copper	100.1	99.2	
Nickel	101.4	102.1	
Lead	94.8	97.6	90.0
Selenium	97.2	100.1	102.2
Zinc	101.6	100.5	

Comments and Conclusions:

ESULTS ARE REPORTED IN PERCENT RECOVERY.

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6320

PROJECT NAME Pier 91
PROJECT NUMBER 624878 MAJOR TASK 7304
SAMPLERS L. LaRosa, D. Broten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE ~~LOCATION~~ #	NO. OF CONTAINERS	TYPE OF ANALYSIS: Total Metals	Dissolved Metals						PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
1614 5-1	4/8/93	1230		✓	CP-107-0493	2	1	1						✓	✓	
-2	4/8/93	1445		✓	CP-106A-0493	2	1	1						✓	✓	

RELINQUISHED BY

SIGNATURE	DATE	TIME
David Broten	4-8-93	16:30

RECEIVED BY

SIGNATURE	DATE	TIME
[signature]	4/8/93	1630

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

BURLINGTON ENVIRONMENTAL

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MAY 1 0 1993

Burlington Environmental Inc.
Technical Services

May 10, 1993

Joe Depner
Burlington Environmental Technical Services
2203 Airport Way South, Suite 400
Seattle, WA 98134

Project: Pier 91 Project #624878, Task #7304
Burlington Environmental Corporate Laboratory Number 46175

Dear Joe:

Six water samples for the Pier 91 Project #624878, Task #7304 were received at our laboratory April 12, 1993. These samples were received in good condition. The samples were analyzed for total and dissolved metals and PCBs at the Burlington Environmental Corporate Laboratory.

All samples were extracted and analyzed within EPA SW-846 required holding times. Analysis dates and extraction dates (as applicable) are included in the metals report. The PCBs were extracted and analyzed in batchs. These dates are tabulated below. All PCB surrogates recovered between 50% and 150%, except sample 46175-5 which had a TCMX recovery of 35% due to an interfering peak.

Laboratory Number(s)	GC Run Number(s)	Date(s) Extracted	Date(s) Analyzed
46175-1,2,3,4,5,6, M04123-3, and B04123-3	AAKZ, CAFX, and CAFW	4/12/93	4/13/93, 4/23/93 and 4/27/93

The analyst(s) name(s) and the instrument used for each analyte are specified on the PCB report and are listed below for the metals analytes.

Analyte(s)	Analyst	Instrument Make and Model
Mercury	Barbara L. Walker	Perkin Elmer 50B Mercury Analyzer
Arsenic, Selenium, Lead	Bruce Bell	Perkin Elmer 5100Z Graphite Furnace Atomic Absorption Spectrometer
Silver, Barium, Cadmium, Copper, Chromium, Nickel, Zinc	Eric Larson	Leeman Labs PS3000 Inductively Coupled Plasma Atomic Emission Spectrometer

All analyses were conducted according to EPA SW-846 Methods specified in the work plan. Additional analytical and quality control information is included in the attached analytical reports.

Sincerely,

Kathy E. Kreps

Kathy E. Kreps
Laboratory Manager
Burlington Environmental Inc.

enclosure

BURLINGTON ENVIRONMENTAL

General Laboratory Report

Lab Number : 46175

Plant/Generator Name : Pier 91; Project #624878 TASK 7306
Sample Type : Groundwater; CP-106B,-115A,-115B,-915A,-122B,-115M
Date of Receipt : 04/12/93 Analyst: BLW,BB,EL,JB,DW
Date of Report : 05/10/93 QC Checked: Kathleen Burgos
Parameters for Analysis: PCBs, Total and Dissolved Metals
Outside Lab : None Outside Lab Report No:

Data:

These six groundwater samples from Pier 91 Project #624878, Task 7306, sample numbers CP-106B-0493, CP-115A-0493, CP-115B-0493, CP-915A-0493, CP-122B-0493, CP-115M-0493 were analyzed for PCBs by Method 8080 and for Total and Dissolved Metals by Methods 7000 and 6010. Copies of all results are attached.

Comments and Conclusions:

BURLINGTON ENVIRONMENTAL

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CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6324

PROJECT NAME Pier 91
PROJECT NUMBER 624878 MAJOR TASK 7306
SAMPLERS L. LaRosa, A. Lajoie, D. Broten
LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE ~~#~~ ~~LOCATION~~	NO. OF CONTAINERS	TYPE OF ANALYSIS: Dissolved Metals	Total Metals	PCB					ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
46715-1	4-9-93	1130		✓	CP-106-B-0493	3	1	1	2					✓	✓	
-2	4-9-93	1530		✓	CP-115A-0493	3	1	1	2					✓	✓	
-3	4-9-93	1500		✓	CP-115B-0493	3	1	1	2					✓	✓	
-4	4-9-93	1530		✓	CP-915A-0493	3	1	1	2					✓	✓	
-5	4-9-93	1830		✓	CP-122B-0493	3	1	1	2					✓	✓	
-6	4-9-93	1100		✓	CP-115M-0493	3	1	1	2					✓	✓	

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
Louis A. LaRosa III	4-12-93	0745	T. Claus	4-12-93	7:45

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

PCB Laboratory Report

Lab Number : 46175

Plant/Generator Name : / PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/12/93 Analyst: BLW,BB,EL,JB,DW
Date of Report : 04/29/93 QC Checked: 5/3/93
Outside Lab : NONE Outside Lab Report No:
Number of Samples :

Run #	Sample ID	Code Numbers	# Drums in Composite	Aroclor #	Total PCB (ppm)
AAKZ43	B04123-3	BLANK			<0.1ppb
AAKZ42	M04123-3	METHOD SPIKE		1248	130%
CAFX17	46175-1	CP-106B-0493			<1.0ppb
CAFW28	46175-2	CP-115A-0493			<0.1ppb
CAFX18	46175-3	CP-115B-0493			<1.0ppb
CAFW30	46175-4	CP-915A-0493			<0.1ppb
CAFX28	46175-5	CP-122B-0493			<10ppb
AAKZ39	46175-6	CP-115M-0493			<0.1ppb
AAKZ41	CCV	5 PPM CCV (111%)		1254	5.56
AAKZ50	CCV	5 PPM CCV (112%)		1248	5.61
AAKZ30	CCV	5 PPM CCV (111%)		1248	5.56
CAFX15	CCV	5 PPM CCV (101%)		1248	5.04
CAFX26	CCV	5 PPM CCV (110%)		1248	5.49
CAFX37	CCV	5 PPM CCV (111%)		1254	5.55
CAFW26	CCV	5 PPM CCV (92%)		1260	4.60
CAFW37	CCV	5 PPM CCV (104%)		1254	5.18

Instruments: Hewlett Packard 5890 and 5890 Series II G.C.s
Analysts: Al Flores-Serrano and Della Kay Wilson

Metals Laboratory Report

Lab Number : 46175

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/12/93 Analyst: BLW, BB, EL, JB
Date of Report : 04/22/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46175-1 TOTAL CP-106-B-0493	46175-1 DISS. CP-106-B-0493	46175-2 TOTAL CP-115A-0493	46175-2 DISS. CP-115A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	0.019	0.011	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.006	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	<0.020	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.
ATES ANALYZED: 4/15/93, 4/17/93, 4/19/93, 4/20/93
/21/93, 4/22/93.

Metals Laboratory Report

Lab Number : 46175

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/12/93 Analyst: BLW, BB, EL, JB
Date of Report : 04/22/93 QC Checked: 4/23/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46175-3 TOTAL CP-115B-0493	46175-3 DISS. CP-115B-0493	46175-4 TOTAL CP-915A-0493	46175-4 DISS. CP-915A-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	0.040	0.011	0.010	0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	0.040	<0.040	<0.040	<0.040
Lead	0.005	<0.003	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	0.048	<0.020	<0.020	<0.020

Comments and Conclusions:

ESULTS ARE REPORTED IN MG/L.

Metals Laboratory Report

Lab Number : 46175

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/12/93 Analyst: BLW, ~~BB~~, EL, JB
Date of Report : 04/22/93 QC Checked: 4/23/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46175-5 TOTAL CP-122B-0493	46175-5 DISS. CP-122B-0493	46175-6 TOTAL CP-115M-0493	46175-6 DISS. CP-115M-0493
Silver	<0.010	<0.010	<0.010	<0.010
Arsenic	<0.010	<0.010	<0.010	<0.010
Barium	<0.20	<0.20	<0.20	<0.20
Beryllium	<0.005	<0.005	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	<0.005
Chromium	0.033	0.012	<0.010	<0.010
Copper	<0.025	<0.025	<0.025	<0.025
Mercury	<0.0002	<0.0002	<0.0002	<0.0002
Nickel	<0.040	<0.040	<0.040	<0.040
Lead	<0.003	<0.012	<0.003	<0.003
Selenium	<0.005	<0.005	<0.005	<0.005
Zinc	0.023	<0.020	<0.020	<0.020

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L.

Metals Laboratory Report

Lab Number : 46175

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/12/93 Analyst: BLW, BB, EL, JB
Date of Report : 04/22/93 QC Checked: 4/23/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	46175-6 MS % RECOVERY	46175-6 MSD % RECOVERY
Silver	103.8	102.6
Arsenic	91.8	92.2
Barium	100.6	101.0
Beryllium	100.4	100.6
Cadmium	102.0	101.2
Chromium	102.2	101.3
Copper	101.4	101.7
Mercury	98.2	101.6
Nickel	102.4	103.0
Lead	99.5	101.5
Selenium	91.3	77.5
Zinc	102.1	102.1

Comments and Conclusions:

ESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46175Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/12/93 Analyst: BLW, ~~BB~~, JLB, EL
Date of Report : 04/22/93 QC Checked:
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

Metals:	PREPARATION BLANK	CONTROL SAMPLE % RECOVERY	% RECOVERY ICV
Silver	<0.010	101.5	
Arsenic	<0.010	97.7	109.2
Barium	<0.20	102.2	
Beryllium	<0.005	101.5	
Cadmium	<0.005	100.4	
Chromium	<0.010	103.6	
Copper	<0.025	104.4	
Mercury	<0.0002	94.8	94.7
Nickel	<0.040	103.6	
Lead	<0.003	104.0	102.0
Selenium	<0.005	95.8	94.4
Zinc	<0.020	101.8	

Comments and Conclusions:

RESULTS ARE REPORTED IN MG/L AND PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46175Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/12/93 Analyst: BLW, BB, JLB, EL
Date of Report : 04/22/93 QC Checked: 4/23/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	% RECOVERY			
Metals:	CCV	CCV	CCV	CCV
Silver	103.0	100.5	100.6	
Arsenic	97.0	91.3	94.3	
Barium	101.2	100.5	100.8	
Beryllium	99.9	98.4	98.4	
Cadmium	100.3	100.0	100.2	
Chromium	100.5	98.6	100.5	
Copper	100.3	100.2	100.8	
Mercury	95.9	108.6	98.3	
Nickel	104.8	98.4	104.4	
Lead	99.6	98.8	90.4	
Selenium	93.6	95.6	90.4	95.2
Zinc	99.2	99.5	99.1	

Comments and Conclusions:

RESULTS ARE REPORTED IN PERCENT RECOVERY.

Metals Laboratory Report

Lab Number : 46175Q

Plant/Generator Name : PIER 91 Pj# 624878 TASK 7306
Sample Type : GROUNDWATER
Date of Receipt : 04/12/93 Analyst: BLW, BB, JLB, EL
Date of Report : 04/22/93 QC Checked: 4/23/93
Parameters for Analysis: TOTAL AND DISSOLVED METALS
Outside Lab : NONE Outside Lab Report No:

METALS BY SW-846 3010, 6010, 7000.

	% RECOVERY
Metals:	CCV
Selenium	98.8

Comments and Conclusions:

ESULTS AREA REPORTED IN PERCENT RECOVERY.

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 1

PROJECT NAME Pier 91

PROJECT NUMBER 624878 MAJOR TASK 7306

SAMPLERS L. La Rosa, A. Lajoie, D. Braten

LAB DESTINATION BEI

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE ~~LOCATION~~ #	NO. OF CONTAINERS	TYPE OF ANALYSIS: Dissolved Metals	Total Metals	PCB					PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
46175-1	4-9-93	1130		✓	CP-106-B-0493	3	1	1	2					✓	✓	
-2	4-9-93	1530		✓	CP-115A-0493	3	1	1	2					✓	✓	
-3	4-9-93	1500		✓	CP-115B-0493	3	1	1	2					✓	✓	
-4	4-9-93	1530		✓	CP-915A-0493	3	1	1	2					✓	✓	
-5	4-9-93	1830		✓	CP-122B-0493	3	1	1	2					✓	✓	
-6	4-9-93	1100		✓	CP-115M-0493	3	1	1	2					✓	✓	

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
[signature]	4-12-93	0745	T. Claus	4-12-93	7:45

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

RECEIVED

MAY 1 4 1993

Burlington Environmental Inc.
Technical Services

TRANSMITTAL MEMORANDUM

DATE: May 12, 1993

TO: David Broten, Burlington Environmental Engineering

PROJECT NAME: Pier 91

PROJECT NUMBER: 624878-7306

LABORATORY NUMBER: 31340

Enclosed are one original and one copy of the Tier II data deliverables package for Laboratory Work Order Number 31340. The samples were received for analysis at Sound Analytical Services, Inc., on April 9, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,

Andrew J. Riddell
Project Manager

is report is issued solely for the use of the person or company to whom it is addressed. This laboratory accepts responsibility only for the due performance of analysis in accordance with lustry acceptable practice. In no event shall Sound Analytical Services, Inc. or its employees be responsible for consequential or special damages in any kind or in any amount.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

May 12, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7306

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31340

The samples were taken on 4/08/93 and were received at Sound on 4/09/93. The samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified. One oil sample was qualitatively screened for total petroleum fuel hydrocarbons in accordance with WA State DOE Method WTPH-HCID. The density of the oil sample was determined in accordance with Standard Methods for the Examination of Water and Wastewater (16th Ed.) Method 213 E.

VOLATILE ORGANICS

Samples 31340-1 through 31340-3 were analyzed on 4/16/93 and 4/19/93. Methylene chloride was detected in the method blanks at levels above the IDL. Results reported for methylene chloride in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 31340-1 and 31340-2 were extracted on 4/15/93 and analyzed on 4/16/93. No compounds were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 31340-1 and 31340-2 were extracted on 4/12/93 and analyzed on 4/13/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 31340-1 and 31340-2 were extracted on 4/12/93 and analyzed on 4/13/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

HYDROCARBON IDENTIFICATION

Sample 31340-1 was extracted on 4/16/93 and analyzed on 4/20/93. No contamination above the PQL was present in the method blank.

SPECIFIC GRAVITY

The specific gravity for sample 31340-1 was determined on 4/13/93.

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istry acceptable practice. In no event shall Sound Analytical Services, Inc. or its employees be responsible for consequential or special damages in any kind or in any amount.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Technical Services Date: April 23, 1993

Report On: Analysis of Oil & Water Lab No.: 31340

IDENTIFICATION:
Samples received on 04-09-93
Project: 624878-7306 Pier 91

ANALYSIS:

Lab Sample No. 31340-1 Client ID: CP-107-0493

Volatile Organics by Method 8240
Date Analyzed: 4-19-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	55	20	
Methylene Chloride	42	10	B1
Acetone	11	100	J
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	2.6	10	J
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	ND	10	
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-1 Client ID: CP-107-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	4.0	10	J

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	103	88 - 110	81 - 117
Bromofluorobenzene	86	86 - 115	74 - 121
1,2-Dichloroethane-D4	110	76 - 114	70 - 121

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-1 Client ID: CP-107-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.9	
bis(2-Chloroethyl) ether	ND	9.9	
2-Chlorophenol	ND	9.9	
1,3-Dichlorobenzene	ND	9.9	
1,4-Dichlorobenzene	ND	9.9	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	9.9	
2-Methylphenol	ND	9.9	
bis(2-Chloroisopropyl)ether	ND	9.9	
4-Methylphenol	ND	9.9	
N-Nitroso-Di-N-propylamine	ND	9.9	
Hexachloroethane	ND	9.9	
Nitrobenzene	ND	9.9	
Isophorone	ND	9.9	
2-Nitrophenol	ND	9.9	
2,4-Dimethylphenol	ND	9.9	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy)methane	ND	9.9	
2,4-Dichlorophenol	ND	9.9	
1,2,4-Trichlorobenzene	ND	9.9	
Naphthalene	ND	9.9	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	9.9	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-1 Client ID: CP-107-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	3.6	9.9	J
Hexachlorocyclopentadiene	ND	9.9	
2,4,6-Trichlorophenol	ND	9.9	
2,4,5-Trichlorophenol	ND	9.9	
2-Chloronaphthalene	ND	9.9	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	9.9	
Acenaphthylene	ND	9.9	
2,6-Dinitrotoluene	ND	9.9	
3-Nitroaniline	ND	50	
Acenaphthene	4.0	9.9	J
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	1.8	9.9	J
2,4-Dinitrotoluene	ND	9.9	
Diethylphthalate	ND	9.9	
4-Chlorophenyl phenyl ether	ND	9.9	
Fluorene	7.6	9.9	J
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	9.9	
4-Bromophenyl phenyl ether	ND	9.9	
Hexachlorobenzene	ND	9.9	
Pentachlorophenol	ND	50	
Phenanthrene	3.4	9.9	J
Anthracene	ND	9.9	
Di-n-butylphthalate	6.0	9.9	J

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-1 Client ID: CP-107-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.9	
Pyrene	ND	9.9	
Butyl benzyl phthalate	ND	9.9	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	9.9	
Chrysene	ND	9.9	
bis(2-ethylhexyl)phthalate	ND	9.9	
Di-n-octyl phthalate	ND	9.9	
Benzo(b)fluoranthene	ND	9.9	
Benzo(k)fluoranthene	ND	9.9	
Benzo(a)pyrene	ND	9.9	
Indeno(1,2,3-cd)pyrene	ND	9.9	
Dibenz(a,h)anthracene	ND	9.9	
Benzo(g,h,i)perylene	ND	9.9	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	69	35 - 114	23 - 120
2-Fluorobiphenyl	64	43 - 116	30 - 115
p-Terphenyl-d_{14}	74	33 - 141	18 - 137
Phenol-d_6	24	10 - 94	24 - 113
2-Fluorophenol	47	21 - 100	25 - 121
2,4,6-Tribromophenol	86	10 - 123	19 - 122

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-1 Client ID: CP-107-0493

TPH Per EPA Method 418.1
Date Extracted: 4-12-93
Date Analyzed: 4-13-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Hydrocarbons	3.5	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 4-14-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Fuel Hydrocarbons, mg/L	ND	0.75	

SURROGATE RECOVERY, %	
1-chlorooctane	87
o-terphenyl	98

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-1 Client ID: CP-107-0493
Matrix: Oil

WTPH-HCID
Date Extracted: 4-16-93
Date Analyzed: 4-20-93

Parameters	Concentration, mg/kg	Flag
Gasoline (C7 - C12)	> 20	
Diesel (> C12 - C24)	> 50	
Heavy Oil (C24+)	< 100	

SURROGATE RECOVERY, %

1-chlorooctane	X10
o-terphenyl	X10

ND - Not Detected
PQL - Practical Quantitation Limit

Parameter	Result
Specific Gravity	0.866

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2 Client ID: CP-106A-0493

Volatile Organics by Method 8240
Date Analyzed: 4-19-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	ND	20	
Methylene Chloride	24	10	B1
Acetone	ND	100	
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	1.8	10	J
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2 Client ID: CP-106A-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	90	86 - 115	74 - 121
1,2-Dichloroethane-D4	106	76 - 114	70 - 121

Continued . . . .

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istry acceptable practice. In no event shall Sound Analytical Services, Inc. or its employees be responsible for consequential or special damages in any kind or in any amount.

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2 Client ID: CP-106A-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.8	
bis(2-Chloroethyl) ether	ND	9.8	
2-Chlorophenol	ND	9.8	
1,3-Dichlorobenzene	ND	9.8	
1,4-Dichlorobenzene	ND	9.8	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	9.8	
2-Methylphenol	ND	9.8	
bis(2-Chloroisopropyl)ether	ND	9.8	
4-Methylphenol	ND	9.8	
N-Nitroso-Di-N-propylamine	ND	9.8	
Hexachloroethane	ND	9.8	
Nitrobenzene	ND	9.8	
Isophorone	ND	9.8	
2-Nitrophenol	ND	9.8	
2,4-Dimethylphenol	ND	9.8	
Benzoic Acid	ND	49	
bis(2-Chloroethoxy)methane	ND	9.8	
2,4-Dichlorophenol	ND	9.8	
1,2,4-Trichlorobenzene	ND	9.8	
Naphthalene	ND	9.8	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	9.8	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2 Client ID: CP-106A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.8	
Hexachlorocyclopentadiene	ND	9.8	
2,4,6-Trichlorophenol	ND	9.8	
2,4,5-Trichlorophenol	ND	9.8	
2-Chloronaphthalene	ND	9.8	
2-Nitroaniline	ND	49	
Dimethyl phthalate	ND	9.8	
Acenaphthylene	ND	9.8	
2,6-Dinitrotoluene	ND	9.8	
3-Nitroaniline	ND	49	
Acenaphthene	ND	9.8	
2,4-Dinitrophenol	ND	49	
4-Nitrophenol	ND	49	
Dibenzofuran	ND	9.8	
2,4-Dinitrotoluene	ND	9.8	
Diethylphthalate	ND	9.8	
4-Chlorophenyl phenyl ether	ND	9.8	
Fluorene	ND	9.8	
4-Nitroaniline	ND	49	
4,6-Dinitro-2-methylphenol	ND	49	
N-Nitrosodiphenylamine	ND	9.8	
4-Bromophenyl phenyl ether	ND	9.8	
Hexachlorobenzene	ND	9.8	
Pentachlorophenol	ND	49	
Phenanthrene	ND	9.8	
Anthracene	ND	9.8	
Di-n-butylphthalate	4.2	9.8	J

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2 Client ID: CP-106A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.8	
Pyrene	ND	9.8	
Butyl benzyl phthalate	ND	9.8	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	9.8	
Chrysene	ND	9.8	
bis(2-ethylhexyl)phthalate	2.8	9.8	J
Di-n-octyl phthalate	ND	9.8	
Benzo(b)fluoranthene	ND	9.8	
Benzo(k)fluoranthene	ND	9.8	
Benzo(a)pyrene	ND	9.8	
Indeno(1,2,3-cd)pyrene	ND	9.8	
Dibenz(a,h)anthracene	ND	9.8	
Benzo(g,h,i)perylene	ND	9.8	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	70	35 - 114	23 - 120
2-Fluorobiphenyl	60	43 - 116	30 - 115
p-Terphenyl-d_{14}	73	33 - 141	18 - 137
Phenol-d_6	23	10 - 94	24 - 113
2-Fluorophenol	48	21 - 100	25 - 121
2,4,6-Tribromophenol	79	10 - 123	19 - 122

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-2 Client ID: CP-106A-0493

TPH Per EPA Method 418.1
Date Extracted: 4-12-93
Date Analyzed: 4-13-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Hydrocarbons	1.8	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-12-93
Date Analyzed: 4-14-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Fuel Hydrocarbons, mg/L	ND	0.75	

SURROGATE RECOVERY, %	
1-chlorooctane	70
o-terphenyl	101

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-3 Client ID: Trip Blank #4

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	ND	20	
Methylene Chloride	17	10	B1
Acetone	ND	100	
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	ND	10	
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31340
April 22, 1993

Lab Sample No. 31340-3 Client ID: Trip Blank #4

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	105	88 - 110	81 - 117
Bromofluorobenzene	91	86 - 115	74 - 121
1,2-Dichloroethane-D4	104	76 - 114	70 - 121

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31340qc7
Units: ug/L
Date: April 22, 1993
Blank No: V9958

METHOD BLANK

Compound	Result	PQL	Flags
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	4.2	5	J
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31340qc7
Date: April 22, 1993
Blank No: V9958

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Control Limits Soil
Toluene - d8	102	86 - 115	81 - 117
Bromofluorobenzene	87	76 - 114	74 - 121
1,2-Dichloroethane d4	103	88 - 110	70 - 121

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31340qc8
Units: ug/L
Date: April 22, 1993
Blank No: V9909

METHOD BLANK

Compound	Result	PQL	Flags
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	5.3	5	
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31340qc8
Date: April 22, 1993
Blank No: V9909

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Control Limits Soil
Toluene - d8	106	86 - 115	81 - 117
Bromofluorobenzene	86	76 - 114	74 - 121
1,2-Dichloroethane d4	101	88 - 110	70 - 121

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

VOLATILE ORGANICS - METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31340qc9
Units: ug/L
Date: April 22, 1993

BLANK SPIKE RECOVERY

Date Analyzed: 4-16-93

Parameter	Blank Spike Result (BS)	Spike Added (SA)	%R	Blank Spike Dup Result (BSD)	Spike Added (SA)	%R	RPD	Flag
1,1-DCE	48	50	96	49	50	98	4.1	
TCE	47	50	94	48	50	96	2.1	
Chloro-benzene	48	50	96	49	50	98	2.1	
Toluene	50	50	100	50	50	100	0.0	
Benzene	47	50	94	49	50	98	4.2	

%R = Percent Recovery
= [(BS / SA] x 100
RPD = Relative Percent Difference
= [(BS - BSD) / ((BS + BSD) / 2] x 100

ADVISORY LIMITS	RPD	% RECOVERY
1,1-Dichloroethene	22	59 - 172
Trichloroethene	24	62 - 137
Chlorobenzene	21	60 - 133
Toluene	21	59 - 139
Benzene	21	66 - 142

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

VOLATILE ORGANICS - METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31340q10
Units: ug/L
Date: April 22, 1993

BLANK SPIKE RECOVERY

Date Analyzed: 4-19-93

Parameter	Blank Spike Result (BS)	Spike Added (SA)	%R	Blank Spike Dup Result (BSD)	Spike Added (SA)	%R	RPD	Flag
1,1-DCE	52	50	104	53	50	106	1.9	
TCE	50	50	100	55	50	110	9.5	
Chloro-benzene	51	50	102	54	50	108	5.7	
Toluene	54	50	108	59	50	118	8.8	
Benzene	50	50	100	54	50	108	7.7	

%R = Percent Recovery
= [(BS / SA] x 100
RPD = Relative Percent Difference
= [(BS - BSD) / ((BS + BSD) / 2] x 100

ADVISORY LIMITS	RPD	% RECOVERY
1,1-Dichloroethene	22	59 - 172
Trichloroethene	24	62 - 137
Chlorobenzene	21	60 - 133
Toluene	21	59 - 139
Benzene	21	66 - 142

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 31340qc5
Units: ug/L
Date: April 22, 1993
Blank No: SBLK89-S8428

METHOD BLANK

Compound	Result	PQL	Flags
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl)ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	20	
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	

PQL - Practical Quantitation Limit
ND - Not Detected

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SOUND ANALYTICAL SERVICES, INC.

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 31340qc5
Units: ug/L
Date: April 22, 1993
Blank No: SBLK89-S8428

METHOD BLANK

Compound	Result	PQL	Flags
3-Nitroaniline	ND	50	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
2,6-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	50	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	ND	10	
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Chrysene	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

PQL - Practical Quantitation Limit
ND - Not Detected

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 31340qc5
Date: April 22, 1993
Blank No: SBLK89-S8428

SEMIVOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d5	76	35 - 114	23 - 120
2-Fluorobiphenyl	62	43 - 116	30 - 115
p-Terphenyl-d14	73	33 - 141	18 - 137
Phenol-d6	27	10 - 94	24 - 113
2-Fluorophenol	52	21 - 100	25 - 121
2,4,6-TBP	72	10 - 123	19 - 122

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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WATER MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Client Name: Burlington Environmental, Technical Services
Lab No: 31340qc6
Date: April 22, 1993

SEMI-VOLATILE ORGANICS

COMPOUND	SPIKE (ug/L)	SAMPLE RESULT	CONC MS	% REC	CONC MSD	% REC	RPD	FLAGS
Phenol	100	ND	25.0	25.0	24.6	24.6	1.6	
2-Chlorophenol	100	ND	57.8	57.8	59.2	59.2	2.4	
1,4-Dichlorobenzene	100	ND	55.1	55.1	50.7	50.7	8.3	
N-nitrosodi-n-Propylamine	100	ND	63.1	63.1	62.5	62.5	1.0	
1,2,4-Trichlorobenzene	100	ND	61.5	61.5	57.3	57.3	7.1	
4-Chloro-3-Methylphenol	100	ND	56.5	56.5	58.2	58.2	3.0	
Acenaphthene	100	ND	58.4	58.4	56.6	56.6	3.1	
4-Nitrophenol	100	ND	20.6	20.6	21.2	21.2	2.9	
2,4 Dinitrotoluene	100	ND	62.7	62.7	61.2	61.2	2.4	
Pentachlorophenol	100	ND	42.5	42.5	49.5	49.5	15.0	
Pyrene	100	ND	72.6	72.6	74.9	74.9	3.1	

RPD = Relative Percent Difference
% REC = Percent Recovery

ADVISORY LIMITS:	RPD	% RECOVERY
Phenol	42	12 - 89
2-Chlorophenol	40	27 - 123
1,4-Dichlorobenzene	28	36 - 97
N-nitrosodi-n-Propylamine	38	41 - 116
1,2,4-Trichlorobenzene	28	39 - 98
4-Chloro-3-Methylphenol	42	23 - 97
Acenaphthene	31	46 - 118
4-Nitrophenol	50	10 - 80
2,4 Dinitrotoluene	38	24 - 96
Pentachlorophenol	50	9 - 103
Pyrene	31	26 - 127

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 31340qc2
Matrix: Water
Units: mg/L
Date: April 22, 1993

DUPLICATE

Dup. No. 31340-1

Parameter	Sample (S)	Duplicate (D)	RPD	PQL	Flags
Total Petroleum Fuel Hydrocarbons	ND	ND	0.0	0.75	
SURROGATE RECOVERY%					
1-chlorooctane	87	83			
o-terphenyl	98	100			

RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MS/MSD No. 31340-1

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	RPD
Total Petroleum Fuel Hydrocarbons	ND	327	402	81	326	0.3

%R = Percent Recovery
= [(MS - SR) / SA] x 100
RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2)] x 100

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 31340qc2
Units: mg/L
Date: April 22, 1993

BLANK SPIKE RECOVERY

BS No. 032.R0101.D

Parameter	Spike Added	Spike Recovered	%R
Total Petroleum Fuel Hydrocarbons	402	406	101

%R = Percent Recovery
= [(BS - SR) / SA] x 100

METHOD BLANK

Blank No. 011R0101.D

Parameter	Result	PQL
Total Petroleum Fuel Hydrocarbons	ND	0.75
SURROGATE RECOVERY%		
1-chlorooctane	96	
o-terphenyl	111	

ND - Not Detected
PQL - Practical Quantitation Limit

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

WTPH-HCID

Client: Burlington Environmental, Technical Services
Lab No: 31340qc1
Units: mg/kg
Date: April 22, 1993

METHOD BLANK

Blank No. 003F0101.D

Parameter	Result	Flags
Gasoline (C_7 - C_{12})	< 20	
Diesel (>C_{12} - C_{24})	< 50	
Heavy Petroleum Oil (C_{24}+)	< 100	
SURROGATE RECOVERY, %		
1-chlorooctane	95	
o-terphenyl	92	

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QUALITY CONTROL REPORT

TPH by Method 418.1

Client: Burlington Environmental, Technical Services
Lab No: 31340qc3
Matrix: Water
Units: mg/L
Date: April 22, 1993

METHOD BLANK

Parameter	Result	PQL
Total Petroleum Hydrocarbons	ND	1.0

ND - Not Detected
PQL - Practical Quantitation Limit

BLANK SPIKE RECOVERY

Parameter	Blank Spike Result (BS)	Spike Added (SA)	%R	Blank Spike Dup Result (BSD)	Spike Added (SA)	%R	RPD	Flag
Total Petroleum Hydrocarbons	70	100	70	84	100	84	18	

%R = Percent Recovery
= [(BS / SA] x 100

RPD = Relative Percent Difference
= [(BS - BSD) / ((BS + BSD) / 2] x 100

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

Specific Gravity

Client: Burlington Environmental, Technical Services
Lab No: 31340qc4
Date: April 22, 1993

DUPLICATE

Dup No. 31340-1

Parameter	Sample(S)	Duplicate(D)	RPD
Specific Gravity	0.8659	0.8653	0.07

RPD = Relative Percent Difference
= [(S - D) / ((S + D) / 2)] x 100

CHECK STANDARD

Environmental Research Associates

Parameter	Result (R)	True Value (TV)	% D
Specific Gravity	0.9996	1.0000	0.04

% D = % Difference
= TV - R / TV x 100

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST. TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

C: The identification of this analyte was confirmed by GC/MS.

B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final extract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

E: The concentration of this analyte exceeded the instrument calibration range.

D: The reported result for this analyte is calculated based on a secondary dilution factor.

A: This TIC is a suspected aldol-condensation product.

M: Quantitation Limits are elevated due to matrix interferences.

S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.

X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.

X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.

X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.

X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike was diluted out during analysis.

X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.

X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.

X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.

X8: Surrogate was diluted out during analysis.

X9: Surrogate recovery outside QC limits due to matrix composition.

X10: Surrogate recovery outside QC limits due to high contaminant levels.

BURLINGTON ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6322

PROJECT NAME Pier 91
PROJECT NUMBER 624878 MAJOR TASK 7306
SAMPLERS L. LaRosa D. Broten
LAB DESTINATION Sound Analytical

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE ~~LOCATION~~ #	NO. OF CONTAINERS	TYPE OF ANALYSIS: VOC 8240	SVOC 8270	TPH 418.1	TPH 8015	Density	HCID	PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
	4-8-93	1230		✓	CP-107-0493	6	2	1	1	1	1	1	✓	✓	
	4-8-93	1445		✓	CP-106A-0493	5	2	1	1	1			✓	✓	
DN					Trip blank TB4		2						✓		

RELINQUISHED BY

SIGNATURE	DATE	TIME
Laura A. La Rosa	4-8-93	1630
J. Palmentier	4-9-93	12:35P

RECEIVED BY

SIGNATURE	DATE	TIME
J. Palmentier	4-9-93	9:55A
D. Broten	4/9/93	12:35

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

RECEIVED

MAY 17 1993

Burlington Environmental Inc.
Technical Services

TRANSMITTAL MEMORANDUM

DATE: May 13, 1993

TO: David Broten, Burlington Environmental Engineering

PROJECT NAME: Pier 91

PROJECT NUMBER: 624878-7306

LABORATORY NUMBER: 31367

Enclosed are one original and one copy of the Tier II data deliverables package for Laboratory Work Order Number 31367. The samples were received for analysis at Sound Analytical Services, Inc., on April 12, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,

Andrew J. Riddell

Andrew J. Riddell
Project Manager

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

May 13, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7306

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31367

The samples were taken on 4/09/93 and were received at Sound on 4/12/93. The samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified.

VOLATILE ORGANICS

Samples 31367-1 through 31367-7 were analyzed on 4/16/93. Methylene chloride was detected in the method blank at a level above the IDL. Results reported for this compound in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 31367-1 through 31367-6 were extracted on 4/15/93 and analyzed on 4/15/93 and 4/16/93. No compounds were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 31367-1 through 31367-6 were extracted and analyzed on 4/15/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 31367-1 through 31367-6 were extracted on 4/14/93 and analyzed on 4/15/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Technical Services

Date: April 20, 1993

Report On: Analysis of Water

Lab No.: 31367

IDENTIFICATION:

Samples received on 04-12-93

Project: 624878-7306 Pier 91

ANALYSIS:

Lab Sample No. 31367-1

Client ID: CP-115M-0493

Volatile Organics by Method 8240

Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	0.43	5	B1
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	1.5	5	J
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected

PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-1 Client ID: CP-115M-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	100	88 - 110	81 - 117
Bromofluorobenzene	87	86 - 115	74 - 121
1,2-Dichloroethane-D4	105	76 - 114	70 - 121

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-1 Client ID: CP-115M-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.6	
bis(2-Chloroethyl) ether	ND	9.6	
2-Chlorophenol	ND	9.6	
1,3-Dichlorobenzene	ND	9.6	
1,4-Dichlorobenzene	ND	9.6	
Benzyl Alcohol	ND	19	
1,2-Dichlorobenzene	ND	9.6	
2-Methylphenol	ND	9.6	
bis(2-Chloroisopropyl)ether	ND	9.6	
4-Methylphenol	ND	9.6	
N-Nitroso-Di-N-propylamine	ND	9.6	
Hexachloroethane	ND	9.6	
Nitrobenzene	ND	9.6	
Isophorone	ND	9.6	
2-Nitrophenol	ND	9.6	
2,4-Dimethylphenol	ND	9.6	
Benzoic Acid	ND	48	
bis(2-Chloroethoxy)methane	ND	9.6	
2,4-Dichlorophenol	ND	9.6	
1,2,4-Trichlorobenzene	ND	9.6	
Naphthalene	ND	9.6	
4-Chloroaniline	ND	19	
Hexachlorobutadiene	ND	9.6	
4-Chloro-3-methylphenol	ND	19	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-1 Client ID: CP-115M-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.6	
Hexachlorocyclopentadiene	ND	9.6	
2,4,6-Trichlorophenol	ND	9.6	
2,4,5-Trichlorophenol	ND	9.6	
2-Chloronaphthalene	ND	9.6	
2-Nitroaniline	ND	48	
Dimethyl phthalate	ND	9.6	
Acenaphthylene	ND	9.6	
2,6-Dinitrotoluene	ND	9.6	
3-Nitroaniline	ND	48	
Acenaphthene	ND	9.6	
2,4-Dinitrophenol	ND	48	
4-Nitrophenol	ND	48	
Dibenzofuran	ND	9.6	
2,4-Dinitrotoluene	ND	9.6	
Diethylphthalate	ND	9.6	
4-Chlorophenyl phenyl ether	ND	9.6	
Fluorene	ND	9.6	
4-Nitroaniline	ND	48	
4,6-Dinitro-2-methylphenol	ND	48	
N-Nitrosodiphenylamine	ND	9.6	
4-Bromophenyl phenyl ether	ND	9.6	
Hexachlorobenzene	ND	9.6	
Pentachlorophenol	ND	48	
Phenanthrene	ND	9.6	
Anthracene	ND	9.6	
Di-n-butylphthalate	ND	9.6	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-1 Client ID: CP-115M-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.6	
Pyrene	ND	9.6	
Butyl benzyl phthalate	ND	9.6	
3,3'-Dichlorobenzidine	ND	19	
Benzo(a)anthracene	ND	9.6	
Chrysene	ND	9.6	
bis(2-ethylhexyl)phthalate	ND	9.6	
Di-n-octyl phthalate	ND	9.6	
Benzo(b)fluoranthene	ND	9.6	
Benzo(k)fluoranthene	ND	9.6	
Benzo(a)pyrene	ND	9.6	
Indeno(1,2,3-cd)pyrene	ND	9.6	
Dibenz(a,h)anthracene	ND	9.6	
Benzo(g,h,i)perylene	ND	9.6	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Control Limits Soil
Nitrobenzene - d_5	70	35 - 114	23 - 120
2-Fluorobiphenyl	57	43 - 116	30 - 115
p-Terphenyl-d_{14}	71	33 - 141	18 - 137
Phenol-d_6	24	10 - 94	24 - 113
2-Fluorophenol	46	21 - 100	25 - 121
2,4,6-Tribromophenol	72	10 - 123	19 - 122

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-1 Client ID: CP-115M-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Fuel Hydrocarbons	ND	0.75	

SURROGATE RECOVERY, %	
1-chlorooctane	114
o-terphenyl	119

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-2 Client ID: CP-106B-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	ND	20	
Methylene Chloride	54	10	B1
Acetone	2.3	100	J
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	ND	10	
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-2 Client ID: CP-106B-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	103	88 - 110	81 - 117
Bromofluorobenzene	91	86 - 115	74 - 121
1,2-Dichloroethane-D4	103	76 - 114	70 - 121

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-2 Client ID: CP-106B-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl)ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	20	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-2 Client ID: CP-106B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	
2,6-Dinitrotoluene	ND	10	
3-Nitroaniline	ND	50	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	50	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-2 Client ID: CP-106B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	10	
Chrysene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	79	35 - 114	23 - 120
2-Fluorobiphenyl	65	43 - 116	30 - 115
p-Terphenyl-d_{14}	68	33 - 141	18 - 137
Phenol-d_6	18	10 - 94	24 - 113
2-Fluorophenol	46	21 - 100	25 - 121
2,4,6-Tribromophenol	97	10 - 123	19 - 122

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-2 Client ID: CP-106B-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Fuel Hydrocarbons	ND	0.75	

SURROGATE RECOVERY, %	
1-chlorooctane	114
o-terphenyl	114

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-3 Client ID: CP-115A-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	2.9	5	B1, J
Acetone	4.3	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-3 Client ID: CP-115A-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	103	88 - 110	81 - 117
Bromofluorobenzene	93	86 - 115	74 - 121
1,2-Dichloroethane-D4	104	76 - 114	70 - 121

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-3 Client ID: CP-115A-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	98	
bis(2-Chloroethyl) ether	ND	98	
2-Chlorophenol	ND	98	
1,3-Dichlorobenzene	ND	98	
1,4-Dichlorobenzene	ND	98	
Benzyl Alcohol	ND	200	
1,2-Dichlorobenzene	ND	98	
2-Methylphenol	ND	98	
bis(2-Chloroisopropyl)ether	ND	98	
4-Methylphenol	ND	98	
N-Nitroso-Di-N-propylamine	ND	98	
Hexachloroethane	ND	98	
Nitrobenzene	ND	98	
Isophorone	ND	98	
2-Nitrophenol	ND	98	
2,4-Dimethylphenol	ND	98	
Benzoic Acid	ND	490	
bis(2-Chloroethoxy)methane	ND	98	
2,4-Dichlorophenol	ND	98	
1,2,4-Trichlorobenzene	ND	98	
Naphthalene	ND	98	
4-Chloroaniline	ND	200	
Hexachlorobutadiene	ND	98	
4-Chloro-3-methylphenol	ND	200	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-3 Client ID: CP-115A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	98	
Hexachlorocyclopentadiene	ND	98	
2,4,6-Trichlorophenol	ND	98	
2,4,5-Trichlorophenol	ND	98	
2-Chloronaphthalene	ND	98	
2-Nitroaniline	ND	490	
Dimethyl phthalate	ND	98	
Acenaphthylene	ND	98	
2,6-Dinitrotoluene	ND	98	
3-Nitroaniline	ND	490	
Acenaphthene	ND	98	
2,4-Dinitrophenol	ND	490	
4-Nitrophenol	ND	490	
Dibenzofuran	ND	98	
2,4-Dinitrotoluene	ND	98	
Diethylphthalate	ND	98	
4-Chlorophenyl phenyl ether	ND	98	
Fluorene	ND	98	
4-Nitroaniline	ND	490	
4,6-Dinitro-2-methylphenol	ND	490	
N-Nitrosodiphenylamine	ND	98	
4-Bromophenyl phenyl ether	ND	98	
Hexachlorobenzene	ND	98	
Pentachlorophenol	ND	490	
Phenanthrene	ND	98	
Anthracene	ND	98	
Di-n-butylphthalate	ND	98	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-3 Client ID: CP-115A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	98	
Pyrene	ND	98	
Butyl benzyl phthalate	ND	98	
3,3'-Dichlorobenzidine	ND	200	
Benzo(a)anthracene	ND	98	
Chrysene	ND	98	
bis(2-ethylhexyl)phthalate	19	98	J
Di-n-octyl phthalate	ND	98	
Benzo(b)fluoranthene	ND	98	
Benzo(k)fluoranthene	ND	98	
Benzo(a)pyrene	ND	98	
Indeno(1,2,3-cd)pyrene	ND	98	
Dibenz(a,h)anthracene	ND	98	
Benzo(g,h,i)perylene	ND	98	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	X8	35 - 114	23 - 120
2-Fluorobiphenyl	X8	43 - 116	30 - 115
p-Terphenyl-d_{14}	X8	33 - 141	18 - 137
Phenol-d_6	X8	10 - 94	24 - 113
2-Fluorophenol	X8	21 - 100	25 - 121
2,4,6-Tribromophenol	X8	10 - 123	19 - 122

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-3 Client ID: CP-115A-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Hydrocarbons	4.4	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Fuel Hydrocarbons	3.0	0.75	

TPH as Diesel

SURROGATE RECOVERY, %	
1-chlorooctane	110
o-terphenyl	110

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-4 Client ID: CP-115B-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	54	5	B1
Acetone	1.5	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-4 Client ID: CP-115B-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	102	88 - 110	81 - 117
Bromofluorobenzene	92	86 - 115	74 - 121
1,2-Dichloroethane-D4	102	76 - 114	70 - 121

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-4 Client ID: CP-115B-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	21	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl)ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	52	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	21	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	21	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-4 Client ID: CP-115B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	52	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	
2,6-Dinitrotoluene	ND	10	
3-Nitroaniline	ND	52	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	52	
4-Nitrophenol	ND	52	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	52	
4,6-Dinitro-2-methylphenol	ND	52	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	52	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	5.0	10	J

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-4 Client ID: CP-115B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	21	
Benzo(a)anthracene	ND	10	
Chrysene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	74	35 - 114	23 - 120
2-Fluorobiphenyl	59	43 - 116	30 - 115
p-Terphenyl-d_{14}	67	33 - 141	18 - 137
Phenol-d_6	22	10 - 94	24 - 113
2-Fluorophenol	49	21 - 100	25 - 121
2,4,6-Tribromophenol	92	10 - 123	19 - 122

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-4 Client ID: CP-115B-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-94
Date Analyzed: 4-15-94

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Fuel Hydrocarbons	ND	0.75	

SURROGATE RECOVERY, %	
1-chlorooctane	119
o-terphenyl	124

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-5 Client ID: CP-915A-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	1.6	5	B1, J
Acetone	5.4	50	J
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-5 Client ID: CP-915A-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	102	88 - 110	81 - 117
Bromofluorobenzene	96	86 - 115	74 - 121
1,2-Dichloroethane-D4	102	76 - 114	70 - 121

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-5 Client ID: CP-915A-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	41	
bis(2-Chloroethyl) ether	ND	41	
2-Chlorophenol	ND	41	
1,3-Dichlorobenzene	ND	41	
1,4-Dichlorobenzene	ND	41	
Benzyl Alcohol	ND	82	
1,2-Dichlorobenzene	ND	41	
2-Methylphenol	ND	41	
bis(2-Chloroisopropyl)ether	ND	41	
4-Methylphenol	ND	41	
N-Nitroso-Di-N-propylamine	ND	41	
Hexachloroethane	ND	41	
Nitrobenzene	ND	41	
Isophorone	ND	41	
2-Nitrophenol	ND	41	
2,4-Dimethylphenol	ND	41	
Benzoic Acid	ND	200	
bis(2-Chloroethoxy)methane	ND	41	
2,4-Dichlorophenol	ND	41	
1,2,4-Trichlorobenzene	ND	41	
Naphthalene	ND	41	
4-Chloroaniline	ND	82	
Hexachlorobutadiene	ND	41	
4-Chloro-3-methylphenol	ND	82	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-5 Client ID: CP-915A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	41	
Hexachlorocyclopentadiene	ND	41	
2,4,6-Trichlorophenol	ND	41	
2,4,5-Trichlorophenol	ND	41	
2-Chloronaphthalene	ND	41	
2-Nitroaniline	ND	200	
Dimethyl phthalate	ND	41	
Acenaphthylene	ND	41	
2,6-Dinitrotoluene	ND	41	
3-Nitroaniline	ND	200	
Acenaphthene	ND	41	
2,4-Dinitrophenol	ND	200	
4-Nitrophenol	ND	200	
Dibenzofuran	ND	41	
2,4-Dinitrotoluene	ND	41	
Diethylphthalate	ND	41	
4-Chlorophenyl phenyl ether	ND	41	
Fluorene	ND	41	
4-Nitroaniline	ND	200	
4,6-Dinitro-2-methylphenol	ND	200	
N-Nitrosodiphenylamine	ND	41	
4-Bromophenyl phenyl ether	ND	41	
Hexachlorobenzene	ND	41	
Pentachlorophenol	ND	200	
Phenanthrene	ND	41	
Anthracene	ND	41	
Di-n-butylphthalate	ND	41	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-5 Client ID: CP-915A-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	41	
Pyrene	ND	41	
Butyl benzyl phthalate	ND	41	
3,3'-Dichlorobenzidine	ND	82	
Benzo(a)anthracene	ND	41	
Chrysene	ND	41	
bis(2-ethylhexyl)phthalate	8.5	41	J
Di-n-octyl phthalate	ND	41	
Benzo(b)fluoranthene	ND	41	
Benzo(k)fluoranthene	ND	41	
Benzo(a)pyrene	ND	41	
Indeno(1,2,3-cd)pyrene	ND	41	
Dibenz(a,h)anthracene	ND	41	
Benzo(g,h,i)perylene	ND	41	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	69	35 - 114	23 - 120
2-Fluorobiphenyl	79	43 - 116	30 - 115
p-Terphenyl-d_{14}	88	33 - 141	18 - 137
Phenol-d_6	19	10 - 94	24 - 113
2-Fluorophenol	52	21 - 100	25 - 121
2,4,6-Tribromophenol	80	10 - 123	19 - 122

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-5 Client ID: CP-915A-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Hydrocarbons	7.1	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Fuel Hydrocarbons	3.6	0.75	
TPH as	Diesel		

SURROGATE RECOVERY, %	
1-chlorooctane	125
o-terphenyl	114

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6 Client ID: CP-122B-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	ND	20	
Methylene Chloride	57	10	B1
Acetone	3.5	100	J
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	2.6	10	J
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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ustry acceptable practice. In no event shall Sound Analytical Services, Inc. or its employees be responsible for consequential or special damages in any kind or in any amount.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6 Client ID: CP-122B-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	98	86 - 115	74 - 121
1,2-Dichloroethane-D4	97	76 - 114	70 - 121

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6 Client ID: CP-122B-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	21	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl)ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	52	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	21	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	21	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6 Client ID: CP-122B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	52	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	
2,6-Dinitrotoluene	ND	10	
3-Nitroaniline	ND	52	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	52	
4-Nitrophenol	ND	52	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	52	
4,6-Dinitro-2-methylphenol	ND	52	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	52	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6 Client ID: CP-122B-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	21	
Benzo(a)anthracene	ND	10	
Chrysene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	68	35 - 114	23 - 120
2-Fluorobiphenyl	57	43 - 116	30 - 115
p-Terphenyl-d_{14}	60	33 - 141	18 - 137
Phenol-d_6	20	10 - 94	24 - 113
2-Fluorophenol	47	21 - 100	25 - 121
2,4,6-Tribromophenol	87	10 - 123	19 - 122

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-6 Client ID: CP-122B-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Fuel Hydrocarbons	ND	0.75	

SURROGATE RECOVERY, %	
1-chlorooctane	114
o-terphenyl	130

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . . .

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Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-7 Client ID: Trip Blank #5

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	7.4	5	B1
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31367
April 20, 1993

Lab Sample No. 31367-7 Client ID: Trip Blank #5

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	103	88 - 110	81 - 117
Bromofluorobenzene	95	86 - 115	74 - 121
1,2-Dichloroethane-D4	102	76 - 114	70 - 121

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST. TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31367qc3
Units: ug/L
Date: April 20, 1993
Blank No: V9909

METHOD BLANK

Compound	Result	PQL	Flags
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	5.3	5	
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31367qc3
Date: April 20, 1993
Blank No: V9909

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Toluene - d8	106	86 - 115	81 - 117
Bromofluorobenzene	86	76 - 114	74 - 121
1,2-Dichloroethane d4	101	88 - 110	70 - 121

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS - METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31367qc6
Units: ug/L
Date: April 30, 1993

BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY

Parameter	Blank Spike Result (BS)	Spike Added (SA)	%R	Blank Spike Dup Result (BSD)	Spike Added (SA)	%R	RPD	Flag
1,1-DCE	48	50	96.0	49	50	98.0	4.1	
TCE	47	50	94.0	48	50	96.0	2.1	
Chloro-benzene	48	50	96.0	49	50	98.0	2.1	
Toluene	50	50	100	50	50	100	0.0	
Benzene	47	50	94.0	49	50	98.0	4.2	

%R = Percent Recovery
= (BS / SA) x 100
RPD = Relative Percent Difference
= [(BS - BSD) / ((BS + BSD) / 2)] x 100

ND - Not Detected

ADVISORY LIMITS	RPD	% RECOVERY
1,1-Dichloroethene	22	59 - 172
Trichloroethene	24	62 - 137
Chlorobenzene	21	60 - 133
Toluene	21	59 - 139
Benzene	21	66 - 142

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 31367qc1
Matrix: Water
Units: mg/L
Date: April 20, 1993

DUPLICATE

Dup. No. 31367-1

Parameter	Sample (S)	Duplicate (D)	RPD	PQL	Flags
Total Petroleum Fuel Hydrocarbons	ND	ND	0.0	0.75	
SURROGATE RECOVERY%					
1-chlorooctane	114	88			
o-terphenyl	119	95			

RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MS/MSD No. 31367-1

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	RPD
Total Petroleum Fuel Hydrocarbons	ND	410	402	102	412	0.5

%R = Percent Recovery
= [(MS - SR) / SA] x 100
RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2)] x 100

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 31367qc1
Units: mg/L
Date: April 20, 1993

BLANK SPIKE RECOVERY

BS No. 004F0101.D

Parameter	Spike Added	Spike Recovered	%R
Total Petroleum Fuel Hydrocarbons	402	337	84

%R = Percent Recovery
= [(BS - SR) / SA] x 100

METHOD BLANK

Blank No. 003R0101.D

Parameter	Result	PQL
Total Petroleum Fuel Hydrocarbons	ND	0.75
SURROGATE RECOVERY%		
1-chlorooctane	108	
o-terphenyl	117	

ND - Not Detected
PQL - Practical Quantitation Limit

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

TPH by Method 418.1

Client: Burlington Environmental, Technical Services
Lab No: 31367qc2
Units: mg/L
Date: April 20, 1993

METHOD BLANK

Parameter	Result	PQL
Total Petroleum Hydrocarbons	ND	1.0

ND - Not Detected
PQL - Practical Quantitation Limit

BLANK SPIKE RECOVERY

Parameter	Spike Added	Spike Recovered	%R
TPH	10	7.7	77

%R = Percent Recovery
= [(BS / SA] x 100

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 31367qc4
Units: ug/L
Date: April 20, 1993
Blank No: SBLK89-S8428

METHOD BLANK

Compound	Result	PQL	Flags
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl)ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	20	
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	

PQL - Practical Quantitation Limit
ND - Not Detected

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SOUND ANALYTICAL SERVICES, INC.

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 31367qc4
Units: ug/L
Date: April 20, 1993
Blank No: SBLK89-S8428

METHOD BLANK

Compound	Result	PQL	Flags
3-Nitroaniline	ND	50	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
2,6-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	50	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	ND	10	
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Chrysene	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

PQL - Practical Quantitation Limit
ND - Not Detected

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 31367qc4
Date: April 20, 1993
Blank No: SBLK89-S8428

SEMIVOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Control Limits Soil
Nitrobenzene - d5	76	35 - 114	23 - 120
2-Fluorobiphenyl	62	43 - 116	30 - 115
p-Terphenyl-d14	73	33 - 141	18 - 137
Phenol-d6	27	10 - 94	24 - 113
2-Fluorophenol	52	21 - 100	25 - 121
2,4,6-TBP	72	10 - 123	19 - 122

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

WATER BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY

Client Name: Burlington Environmental, Technical Services
Lab No: 31367qc5
Date: April 20, 1993

SEMI-VOLATILE ORGANICS

COMPOUND	SPIKE (ug/L)	SAMPLE RESULT	CONC MS	% REC	CONC MSD	% REC	RPD	FLAGS
Phenol	100	ND	25.0	25.0	24.6	24.6	1.6	
2-Chlorophenol	100	ND	57.8	57.8	59.2	59.2	2.4	
1,4-Dichlorobenzene	100	ND	55.1	55.1	50.7	50.7	8.3	
N-nitrosodi-n-Propylamine	100	ND	63.1	63.1	62.5	62.5	1.0	
1,2,4-Trichlorobenzene	100	ND	61.5	61.5	57.3	57.3	7.1	
4-Chloro-3-Methylphenol	100	ND	56.5	56.5	58.2	58.2	3.0	
Acenaphthene	100	ND	58.4	58.4	56.6	56.6	3.1	
4-Nitrophenol	100	ND	20.4	20.4	21.2	21.2	2.9	
2,4 Dinitrotoluene	100	ND	62.7	62.7	61.2	61.2	2.4	
Pentachlorophenol	100	ND	42.5	42.5	49.5	49.5	15	
Pyrene	100	ND	72.6	72.6	74.9	74.9	3.1	

RPD = Relative Percent Difference
% REC = Percent Recovery

ADVISORY LIMITS:	RPD	% RECOVERY
Phenol	42	12 - 89
2-Chlorophenol	40	27 - 123
1,4-Dichlorobenzene	28	36 - 97
N-nitrosodi-n-Propylamine	38	41 - 116
1,2,4-Trichlorobenzene	28	39 - 98
4-Chloro-3-Methylphenol	42	23 - 97
Acenaphthene	31	46 - 118
4-Nitrophenol	50	10 - 80
2,4 Dinitrotoluene	38	24 - 96
Pentachlorophenol	50	9 - 103
Pyrene	31	26 - 127

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

C: The identification of this analyte was confirmed by GC/MS.

B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final extract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

E: The concentration of this analyte exceeded the instrument calibration range.

D: The reported result for this analyte is calculated based on a secondary dilution factor.

A: This TIC is a suspected aldol-condensation product.

M: Quantitation Limits are elevated due to matrix interferences.

S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.

X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.

X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.

X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.

X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike was diluted out during analysis.

X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.

X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.

X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.

X8: Surrogate was diluted out during analysis.

X9: Surrogate recovery outside QC limits due to matrix composition.

X10: Surrogate recovery outside QC limits due to high contaminant levels.

BURLINGTON ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6323

PROJECT NAME: Pier 91
PROJECT NUMBER: C24878 MAJOR TASK: 7306
SAMPLERS: L. LaRosa, A. Lajoie, D. Broten
LAB DESTINATION: Sound Analytical Service

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE ~~LOCATION~~ #	NO. OF CONTAINERS	VOC 8240	SVOC 8270	TPH 418.1	TPH 8015			ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
	4-9-93	1100		✓	CP-115M-0493	5	2	1	1	1			✓	✓	
	4-9-93	1130		✓	CP-106B-0493	5	2	1	1	1			✓	✓	
	4-9-93	1530		✓	CP-115A-0493	5	2	1	1	1			✓	✓	
	4-9-93	1500		✓	CP-115B-0493	5	2	1	1	1			✓	✓	
X	4-9-93	1530		✓	CP-915A-0493	5	2	1	1	1			✓	✓	
	4-9-93	1830		✓	CP-122B-0493	5	2	1	1	1			✓	✓	
DN					Trip blank #5		2								

RELINQUISHED BY SIGNATURE	DATE	TIME	RECEIVED BY SIGNATURE	DATE	TIME
Louis A. La Rosa	4-12-93	0745	J. Palmer	4-12-93	10:20 A
			D. [signature]	4/12	12:00

SHIPPING NOTES

LAB NOTES: changed per Lou 4/14

BE-34 (1/92)

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

TRANSMITTAL MEMORANDUM

RECEIVED

MAY 17 1993

Burlington Environmental Inc.
Technical Services

DATE: May 14, 1993

TO: David Broten, Burlington Environmental Engineering

PROJECT NAME: Pier 91

PROJECT NUMBER: 624878-7306

LABORATORY NUMBER: 31409

Enclosed are one original and one copy of the Tier II data deliverables package for Laboratory Work Order Number 31409. The samples were received for analysis at Sound Analytical Services, Inc., on April 13, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,

Andrew J. Riddell

Andrew J. Riddell
Project Manager

s report is issued solely for the use of the person or company to whom it is addressed. This laboratory accepts responsibility only for the due performance of analysis in accordance with istry acceptable practice. In no event shall Sound Analytical Services, Inc. or its employees be responsible for consequential or special damages in any kind or in any amount.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

May 13, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7306

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 31409

The samples were taken on 4/12/93 and were received at Sound on 4/13/93. The samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified. One oil sample was qualitatively screened for total petroleum fuel hydrocarbons in accordance with WA State DOE Method WTPH-HCID. The density of the oil sample was determined in accordance with Standard Methods for the Examination of Water and Wastewater (16th Ed.) Method 213 E.

VOLATILE ORGANICS

Samples 31409-1 through 31409-3 were analyzed on 4/16/93 and 4/19/93. Methylene chloride was detected in the method blanks at levels above the IDL. Results reported for methylene chloride in the associated samples were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 31409-1 and 31409-2 were extracted on 4/15/93 and analyzed on 4/16/93. No compounds were detected in the method blank above the IDL. All QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 31409-1 and 31409-2 were extracted on 4/15/93 and analyzed on 4/16/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS

Samples 31409-1 and 31409-2 were extracted on 4/14/93 and analyzed on 4/15/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

HYDROCARBON IDENTIFICATION

Sample 31409-4 was extracted on 4/16/93 and analyzed on 4/19/93. No contamination above the PQL was present in the method blank.

SPECIFIC GRAVITY

The specific gravity for sample 31409-4 was determined on 4/16/93.

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Technical Services

Date: April 22, 1993

Report On: Analysis of Oil & Water

Lab No.: 31409

IDENTIFICATION:
Samples received on 04-13-93
Project: 624878-7306 Pier 91

ANALYSIS:

Lab Sample No. 31409-1 Client ID: CP-121-0493

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	4.0	5	B1, J
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	0.77	5	J
1,2-Dichloroethane	1.2	5	J
2-Butanone	ND	25	
1,1,1-Trichloroethane	0.82	5	J
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	3.3	5	J
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-1 Client ID: CP-121-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	0.69	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	1.4	5	
Styrene	ND	5	
Total Xylenes	1.7	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	111	88 - 110	81 - 117
Bromofluorobenzene	87	86 - 115	74 - 121
1,2-Dichloroethane-D4	103	76 - 114	70 - 121

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-1 Client ID: CP-121-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.6	
bis(2-Chloroethyl) ether	ND	9.6	
2-Chlorophenol	ND	9.6	
1,3-Dichlorobenzene	ND	9.6	
1,4-Dichlorobenzene	ND	9.6	
Benzyl Alcohol	ND	19	
1,2-Dichlorobenzene	ND	9.6	
2-Methylphenol	ND	9.6	
bis(2-Chloroisopropyl)ether	ND	9.6	
4-Methylphenol	ND	9.6	
N-Nitroso-Di-N-propylamine	ND	9.6	
Hexachloroethane	ND	9.6	
Nitrobenzene	ND	9.6	
Isophorone	ND	9.6	
2-Nitrophenol	ND	9.6	
2,4-Dimethylphenol	ND	9.6	
Benzoic Acid	ND	48	
bis(2-Chloroethoxy)methane	ND	9.6	
2,4-Dichlorophenol	ND	9.6	
1,2,4-Trichlorobenzene	ND	9.6	
Naphthalene	ND	9.6	
4-Chloroaniline	ND	19	
Hexachlorobutadiene	ND	9.6	
4-Chloro-3-methylphenol	ND	19	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-1 Client ID: CP-121-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	ND	9.6	
Hexachlorocyclopentadiene	ND	9.6	
2,4,6-Trichlorophenol	ND	9.6	
2,4,5-Trichlorophenol	ND	9.6	
2-Chloronaphthalene	ND	9.6	
2-Nitroaniline	ND	48	
Dimethyl phthalate	ND	9.6	
Acenaphthylene	ND	9.6	
2,6-Dinitrotoluene	ND	9.6	
3-Nitroaniline	ND	48	
Acenaphthene	ND	9.6	
2,4-Dinitrophenol	ND	48	
4-Nitrophenol	ND	48	
Dibenzofuran	ND	9.6	
2,4-Dinitrotoluene	ND	9.6	
Diethylphthalate	ND	9.6	
4-Chlorophenyl phenyl ether	ND	9.6	
Fluorene	ND	9.6	
4-Nitroaniline	ND	48	
4,6-Dinitro-2-methylphenol	ND	48	
N-Nitrosodiphenylamine	ND	9.6	
4-Bromophenyl phenyl ether	ND	9.6	
Hexachlorobenzene	ND	9.6	
Pentachlorophenol	ND	48	
Phenanthrene	ND	9.6	
Anthracene	ND	9.6	
Di-n-butylphthalate	2.4	9.6	J

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-1 Client ID: CP-121-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.6	
Pyrene	ND	9.6	
Butyl benzyl phthalate	ND	9.6	
3,3'-Dichlorobenzidine	ND	19	
Benzo(a)anthracene	ND	9.6	
Chrysene	ND	9.6	
bis(2-ethylhexyl)phthalate	1.6	9.6	J
Di-n-octyl phthalate	ND	9.6	
Benzo(b)fluoranthene	ND	9.6	
Benzo(k)fluoranthene	ND	9.6	
Benzo(a)pyrene	ND	9.6	
Indeno(1,2,3-cd)pyrene	ND	9.6	
Dibenz(a,h)anthracene	ND	9.6	
Benzo(g,h,i)perylene	ND	9.6	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	69	35 - 114	23 - 120
2-Fluorobiphenyl	64	43 - 116	30 - 115
p-Terphenyl-d_{14}	67	33 - 141	18 - 137
Phenol-d_6	23	10 - 94	24 - 113
2-Fluorophenol	44	21 - 100	25 - 121
2,4,6-Tribromophenol	80	10 - 123	19 - 122

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-1 Client ID: CP-121-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Fuel Hydrocarbons, mg/L	ND	0.75	

SURROGATE RECOVERY, %	
1-chlorooctane	109
o-terphenyl	115

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2 Client ID: CP-110-0493

Volatile Organics by Method 8240
Date Analyzed: 4-19-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	24	10	
Methylene Chloride	ND	5	
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2 Client ID: CP-110-0493

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	5.8	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	1.3	5	J
Chlorobenzene	ND	5	
Ethyl Benzene	1.7	5	J
Styrene	ND	5	
Total Xylenes	3.1	5	J

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	86	86 - 115	74 - 121
1,2-Dichloroethane-D4	103	76 - 114	70 - 121

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2 Client ID: CP-110-0493

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Phenol	ND	9.6	
bis(2-Chloroethyl) ether	ND	9.6	
2-Chlorophenol	ND	9.6	
1,3-Dichlorobenzene	ND	9.6	
1,4-Dichlorobenzene	ND	9.6	
Benzyl Alcohol	ND	19	
1,2-Dichlorobenzene	ND	9.6	
2-Methylphenol	ND	9.6	
bis(2-Chloroisopropyl)ether	ND	9.6	
4-Methylphenol	ND	9.6	
N-Nitroso-Di-N-propylamine	ND	9.6	
Hexachloroethane	ND	9.6	
Nitrobenzene	ND	9.6	
Isophorone	ND	9.6	
2-Nitrophenol	ND	9.6	
2,4-Dimethylphenol	ND	9.6	
Benzoic Acid	ND	48	
bis(2-Chloroethoxy)methane	ND	9.6	
2,4-Dichlorophenol	ND	9.6	
1,2,4-Trichlorobenzene	ND	9.6	
Naphthalene	ND	9.6	
4-Chloroaniline	ND	19	
Hexachlorobutadiene	ND	9.6	
4-Chloro-3-methylphenol	ND	19	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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istry acceptable practice. In no event shall Sound Analytical Services, Inc. or its employees be responsible for consequential or special damages in any kind or in any amount.

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2 Client ID: CP-110-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
2-Methylnaphthalene	2.7	9.6	J
Hexachlorocyclopentadiene	ND	9.6	
2,4,6-Trichlorophenol	ND	9.6	
2,4,5-Trichlorophenol	ND	9.6	
2-Chloronaphthalene	ND	9.6	
2-Nitroaniline	ND	48	
Dimethyl phthalate	ND	9.6	
Acenaphthylene	ND	9.6	
2,6-Dinitrotoluene	ND	9.6	
3-Nitroaniline	ND	48	
Acenaphthene	2.6	9.6	J
2,4-Dinitrophenol	ND	48	
4-Nitrophenol	ND	48	
Dibenzofuran	ND	9.6	
2,4-Dinitrotoluene	ND	9.6	
Diethylphthalate	ND	9.6	
4-Chlorophenyl phenyl ether	ND	9.6	
Fluorene	6.8	9.6	J
4-Nitroaniline	ND	48	
4,6-Dinitro-2-methylphenol	ND	48	
N-Nitrosodiphenylamine	ND	9.6	
4-Bromophenyl phenyl ether	ND	9.6	
Hexachlorobenzene	ND	9.6	
Pentachlorophenol	ND	48	
Phenanthrene	4.1	9.6	J
Anthracene	ND	9.6	
Di-n-butylphthalate	1.4	9.6	J

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2 Client ID: CP-110-0493

EPA Method 8270 Continued

Compound	Concentration ug/L	PQL	Flag
Fluoranthene	ND	9.6	
Pyrene	ND	9.6	
Butyl benzyl phthalate	ND	9.6	
3,3'-Dichlorobenzidine	ND	19	
Benzo(a)anthracene	ND	9.6	
Chrysene	ND	9.6	
bis(2-ethylhexyl)phthalate	ND	9.6	
Di-n-octyl phthalate	ND	9.6	
Benzo(b)fluoranthene	ND	9.6	
Benzo(k)fluoranthene	ND	9.6	
Benzo(a)pyrene	ND	9.6	
Indeno(1,2,3-cd)pyrene	ND	9.6	
Dibenz(a,h)anthracene	ND	9.6	
Benzo(g,h,i)perylene	ND	9.6	

ND - Not Detected
PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	65	35 - 114	23 - 120
2-Fluorobiphenyl	63	43 - 116	30 - 115
p-Terphenyl-d_{14}	69	33 - 141	18 - 137
Phenol-d_6	25	10 - 94	24 - 113
2-Fluorophenol	47	21 - 100	25 - 121
2,4,6-Tribromophenol	90	10 - 123	19 - 122

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-2 Client ID: CP-110-0493

TPH Per EPA Method 418.1
Date Extracted: 4-14-93
Date Analyzed: 4-15-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Hydrocarbons	ND	1.0	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 4-15-93
Date Analyzed: 4-16-93

Parameter	Concentration, mg/L	PQL	Flag
Total Petroleum Fuel Hydrocarbons, mg/L	ND	0.75	

SURROGATE RECOVERY, %	
1-chlorooctane	109
o-terphenyl	112

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-3 Client ID: Trip Blank #6

Volatile Organics by Method 8240
Date Analyzed: 4-16-93

Compound	Concentration ug/L	PQL	Flag
Chloromethane	ND	20	
Bromomethane	ND	20	
Vinyl Chloride	ND	20	
Chloroethane	ND	20	
Methylene Chloride	58	10	B1
Acetone	ND	100	
Carbon Disulfide	ND	10	
1,1-Dichloroethene	ND	10	
1,1-Dichloroethane	ND	10	
1,2-Dichloroethene (Total)	ND	10	
Chloroform	ND	10	
1,2-Dichloroethane	ND	10	
2-Butanone	ND	50	
1,1,1-Trichloroethane	ND	10	
Carbon Tetrachloride	ND	10	
Vinyl Acetate	ND	50	
Bromodichloromethane	ND	10	
1,2-Dichloropropane	ND	10	
Cis-1,3-Dichloropropene	ND	10	
Trichloroethene	ND	10	
Dibromochloromethane	ND	10	
1,1,2-Trichloroethane	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-3 Client ID: Trip Blank #6

8240 Continued . . .

Compound	Concentration ug/L	PQL	Flag
Benzene	ND	10	
Trans-1,3-Dichloropropene	ND	10	
Bromoform	ND	10	
4-Methyl-2-Pentanone	ND	50	
2-Hexanone	ND	10	
Tetrachloroethene	ND	10	
1,1,2,2-Tetrachloroethane	ND	10	
Toluene	ND	10	
Chlorobenzene	ND	10	
Ethyl Benzene	ND	10	
Styrene	ND	10	
Total Xylenes	ND	10	

ND - Not Detected
PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	95	86 - 115	74 - 121
1,2-Dichloroethane-D4	103	76 - 114	70 - 121

Continued . . . .

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SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7306 Pier 91

Lab No. 31409
April 22, 1993

Lab Sample No. 31409-4 Client ID: CP-110-0493
Matrix: Oil

WTPH-HCID
Date Extracted: 4-16-93
Date Analyzed: 4-20-93

Parameters	Concentration, mg/kg	Flag
Gasoline (C7 - C12)	> 20	
Diesel (> C12 - C24)	> 50	
Heavy Oil (C24+)	< 100	

SURROGATE RECOVERY, %

1-chlorooctane	X10
o-terphenyl	X10

ND - Not Detected
PQL - Practical Quantitation Limit

Parameter	Result
Specific Gravity	0.9506

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31409qc1
Units: ug/L
Date: April 22, 1993
Blank No: V9909

METHOD BLANK

Compound	Result	PQL	Flags
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	5.3	5	
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31409qc1
Date: April 22, 1993
Blank No: V9909

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Control Limits Soil
Toluene - d8	106	86 - 115	81 - 117
Bromofluorobenzene	86	76 - 114	74 - 121
1,2-Dichloroethane d4	101	88 - 110	70 - 121

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31409qc2
Units: ug/L
Date: April 22, 1993
Blank No: V9958

METHOD BLANK

Compound	Result	PQL	Flags
Chloromethane	ND	10	
Bromomethane	ND	10	
Vinyl Chloride	ND	10	
Chloroethane	ND	10	
Methylene Chloride	4.2	5	J
Acetone	ND	50	
Carbon Disulfide	ND	5	
1,1-Dichloroethene	ND	5	
1,1-Dichloroethane	ND	5	
1,2-Dichloroethene (Total)	ND	5	
Chloroform	ND	5	
1,2-Dichloroethane	ND	5	
2-Butanone	ND	25	
1,1,1-Trichloroethane	ND	5	
Carbon Tetrachloride	ND	5	
Vinyl Acetate	ND	25	
Bromodichloromethane	ND	5	
1,2-Dichloropropane	ND	5	
Cis-1,3-Dichloropropene	ND	5	
Trichloroethene	ND	5	
Dibromochloromethane	ND	5	
1,1,2-Trichloroethane	ND	5	
Benzene	ND	5	
Trans-1,3-Dichloropropene	ND	5	
Bromoform	ND	5	
4-Methyl-2-Pentanone	ND	25	
2-Hexanone	ND	5	
Tetrachloroethene	ND	5	
1,1,2,2-Tetrachloroethane	ND	5	
Toluene	ND	5	
Chlorobenzene	ND	5	
Ethyl Benzene	ND	5	
Styrene	ND	5	
Total Xylenes	ND	5	

ND - Not Detected
PQL - Practical Quantitation Limit

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31409qc2
Date: April 22, 1993
Blank No: V9958

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Control Limits Soil
Toluene - d8	101	86 - 115	81 - 117
Bromofluorobenzene	87	76 - 114	74 - 121
1,2-Dichloroethane d4	103	88 - 110	70 - 121

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS - METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31409qc3
Units: ug/L
Date: April 22, 1993

BLANK SPIKE RECOVERY

Date Analyzed: 4-16-93

Parameter	Blank Spike Result (BS)	Spike Added (SA)	%R	Blank Spike Dup Result (BSD)	Spike Added (SA)	%R	RPD	Flag
1,1-DCE	48	50	96	49	50	98	4.1	
TCE	47	50	94	48	50	96	2.1	
Chloro-benzene	48	50	96	49	50	98	2.1	
Toluene	50	50	100	50	50	100	0.0	
Benzene	47	50	94	49	50	98	4.2	

%R = Percent Recovery
= [(BS / SA] x 100
RPD = Relative Percent Difference
= [(BS - BSD) / ((BS + BSD) / 2] x 100

ND - Not Detected

ADVISORY LIMITS	RPD	% RECOVERY
1,1-Dichloroethene	22	59 - 172
Trichloroethene	24	62 - 137
Chlorobenzene	21	60 - 133
Toluene	21	59 - 139
Benzene	21	66 - 142

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

VOLATILE ORGANICS - METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 31409qc4
Units: ug/L
Date: April 22, 1993

BLANK SPIKE RECOVERY

Date Analyzed: 4-19-93

Parameter	Blank Spike Result (BS)	Spike Added (SA)	%R	Blank Spike Dup Result (BSD)	Spike Added (SA)	%R	RPD	Flag
1,1-DCE	52	50	104	53	50	106	1.9	
TCE	50	50	100	55	50	110	9.5	
Chloro-benzene	51	50	102	54	50	108	5.7	
Toluene	54	50	108	59	50	118	8.8	
Benzene	50	50	100	54	50	108	7.7	

%R = Percent Recovery
= [(BS / SA] x 100
RPD = Relative Percent Difference
= [(BS - BSD) / ((BS + BSD) / 2] x 100

ND - Not Detected

ADVISORY LIMITS	RPD	% RECOVERY
1,1-Dichloroethene	22	59 - 172
Trichloroethene	24	62 - 137
Chlorobenzene	21	60 - 133
Toluene	21	59 - 139
Benzene	21	66 - 142

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 31409qc5
Units: ug/L
Date: April 22, 1993
Blank No: SBLK89-S8428

METHOD BLANK

Compound	Result	PQL	Flags
Phenol	ND	10	
bis(2-Chloroethyl) ether	ND	10	
2-Chlorophenol	ND	10	
1,3-Dichlorobenzene	ND	10	
1,4-Dichlorobenzene	ND	10	
Benzyl Alcohol	ND	20	
1,2-Dichlorobenzene	ND	10	
2-Methylphenol	ND	10	
bis(2-Chloroisopropyl)ether	ND	10	
4-Methylphenol	ND	10	
N-Nitroso-Di-N-propylamine	ND	10	
Hexachloroethane	ND	10	
Nitrobenzene	ND	10	
Isophorone	ND	10	
2-Nitrophenol	ND	10	
2,4-Dimethylphenol	ND	10	
Benzoic Acid	ND	50	
bis(2-Chloroethoxy)methane	ND	10	
2,4-Dichlorophenol	ND	10	
1,2,4-Trichlorobenzene	ND	10	
Naphthalene	ND	10	
4-Chloroaniline	ND	20	
Hexachlorobutadiene	ND	10	
4-Chloro-3-methylphenol	ND	20	
2-Methylnaphthalene	ND	10	
Hexachlorocyclopentadiene	ND	10	
2,4,6-Trichlorophenol	ND	10	
2,4,5-Trichlorophenol	ND	10	
2-Chloronaphthalene	ND	10	
2-Nitroaniline	ND	50	
Dimethyl phthalate	ND	10	
Acenaphthylene	ND	10	

PQL - Practical Quantitation Limit
ND - Not Detected

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SOUND ANALYTICAL SERVICES, INC.

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 31409qc5
Units: ug/L
Date: April 22, 1993
Blank No: SBLK89-S8428

METHOD BLANK

Compound	Result	PQL	Flags
3-Nitroaniline	ND	50	
Acenaphthene	ND	10	
2,4-Dinitrophenol	ND	50	
4-Nitrophenol	ND	50	
Dibenzofuran	ND	10	
2,4-Dinitrotoluene	ND	10	
2,6-Dinitrotoluene	ND	10	
Diethylphthalate	ND	10	
4-Chlorophenyl phenyl ether	ND	10	
Fluorene	ND	10	
4-Nitroaniline	ND	50	
4,6-Dinitro-2-methylphenol	ND	50	
N-Nitrosodiphenylamine	ND	10	
4-Bromophenyl phenyl ether	ND	10	
Hexachlorobenzene	ND	10	
Pentachlorophenol	ND	50	
Phenanthrene	ND	10	
Anthracene	ND	10	
Di-n-butylphthalate	ND	10	
Fluoranthene	ND	10	
Pyrene	ND	10	
Butyl benzyl phthalate	ND	10	
3,3'-Dichlorobenzidine	ND	20	
Benzo(a)anthracene	ND	10	
bis(2-ethylhexyl)phthalate	ND	10	
Chrysene	ND	10	
Di-n-octyl phthalate	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Indeno(1,2,3-cd)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

PQL - Practical Quantitation Limit
ND - Not Detected

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 31409qc5
Date: April 22, 1993
Blank No: SBLK89-S8428

SEMIVOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d5	76	35 - 114	23 - 120
2-Fluorobiphenyl	62	43 - 116	30 - 115
p-Terphenyl-d14	73	33 - 141	18 - 137
Phenol-d6	27	10 - 94	24 - 113
2-Fluorophenol	52	21 - 100	25 - 121
2,4,6-TBP	72	10 - 123	19 - 122

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istry acceptable practice. In no event shall Sound Analytical Services, Inc. or its employees be responsible for consequential or special damages in any kind or in any amount.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

WATER MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Client Name: Burlington Environmental, Technical Services
Lab No: 31409qc6
Date: April 22, 1993

SEMI-VOLATILE ORGANICS

COMPOUND	SPIKE (ug/L)	SAMPLE RESULT	CONC MS	% REC	CONC MSD	% REC	RPD	FLAGS
Phenol	100	ND	25.0	25.0	24.6	24.6	1.61	
2-Chlorophenol	100	ND	57.8	57.8	59.2	59.2	2.39	
1,4-Dichlorobenzene	100	ND	55.1	55.1	50.7	50.7	8.32	
N-nitrosodi-n-Propylamine	100	ND	63.1	63.1	62.5	62.5	0.96	
1,2,4-Trichlorobenzene	100	ND	61.5	61.5	57.3	57.3	7.07	
4-Chloro-3-Methylphenol	100	ND	56.5	56.5	58.2	58.2	2.96	
Acenaphthene	100	ND	58.4	58.4	56.6	56.6	3.13	
4-Nitrophenol	100	ND	20.6	20.6	21.2	21.2	2.87	
2,4 Dinitrotoluene	100	ND	62.7	62.7	61.2	61.2	2.42	
Pentachlorophenol	100	ND	42.5	42.5	49.5	49.5	15.2	
Pyrene	100	ND	72.6	72.6	74.9	74.9	3.12	

RPD = Relative Percent Difference
REC = Percent Recovery

ADVISORY LIMITS:	RPD	% RECOVERY
Phenol	42	12 - 89
2-Chlorophenol	40	27 - 123
1,4-Dichlorobenzene	28	36 - 97
N-nitrosodi-n-Propylamine	38	41 - 116
1,2,4-Trichlorobenzene	28	39 - 98
4-Chloro-3-Methylphenol	42	23 - 97
Acenaphthene	31	46 - 118
4-Nitrophenol	50	10 - 80
2,4 Dinitrotoluene	38	24 - 96
Pentachlorophenol	50	9 - 103
Pyrene	31	26 - 127

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 31409qc7
Matrix: Water
Units: mg/L
Date: April 22, 1993

DUPLICATE

Dup. No. 31367-1 Batch Q.C.

Parameter	Sample (S)	Duplicate (D)	RPD	PQL	Flags
Total Petroleum Fuel Hydrocarbons	ND	ND	0.0	0.75	
SURROGATE RECOVERY%					
1-chlorooctane	114	88			
o-terphenyl	119	95			

RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MS/MSD No. 31367-1 Batch Q.C.

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	RPD
Total Petroleum Fuel Hydrocarbons	ND	410	402	102	412	0.5

%R = Percent Recovery
= [(MS - SR) / SA] x 100
RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2)] x 100

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SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 31409qc7
Units: mg/L
Date: April 22, 1993

BLANK SPIKE RECOVERY

BS No. 004F0101.D

Parameter	Spike Added	Spike Recovered	%R
Total Petroleum Fuel Hydrocarbons	402	337	84

%R = Percent Recovery
= [(BS - SR) / SA] x 100

METHOD BLANK

Blank No. 003F0101.D

Parameter	Result	PQL
Total Petroleum Fuel Hydrocarbons	ND	0.75
SURROGATE RECOVERY%		
1-chlorooctane	108	
o-terphenyl	117	

ND - Not Detected
PQL - Practical Quantitation Limit

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SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

WTPH-HCID

Client: Burlington Environmental, Technical Services
Lab No: 31409qc8
Units: mg/kg
Date: April 22, 1993

METHOD BLANK

Blank No. 003F0101.D

Parameter	Result	Flags
Gasoline (C_7 - C_{12})	< 20	
Diesel (>C_{12} - C_{24})	< 50	
Heavy Petroleum Oil (C_{24}+)	< 100	
SURROGATE RECOVERY, %		
1-chlorooctane	95	
o-terphenyl	92	

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SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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DATA QUALIFIER FLAGS

ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

C: The identification of this analyte was confirmed by GC/MS.

B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final extract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

E: The concentration of this analyte exceeded the instrument calibration range.

D: The reported result for this analyte is calculated based on a secondary dilution factor.

A: This TIC is a suspected aldol-condensation product.

M: Quantitation Limits are elevated due to matrix interferences.

S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.

X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.

X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.

X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.

X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike was diluted out during analysis.

X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.

X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.

X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.

X8: Surrogate was diluted out during analysis.

X9: Surrogate recovery outside QC limits due to matrix composition.

X10: Surrogate recovery outside QC limits due to high contaminant levels.

BURLINGTON
ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6325

PROJECT NAME Pier 91
PROJECT NUMBER 624878 MAJOR TASK 7306
SAMPLERS L. LA ROSA, A. LAJOIE
LAB DESTINATION SOUND ANALYTICAL SERVICE

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE ~~LOCATION~~ #	NO. OF CONTAINERS	TYPE OF ANALYSIS: VOC 8240	SVOC 8270	TPH 418.1	TPH 8015	DENSITY	HCID	PRESERVATIVES: ICED	CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
	4-12-93	1111		✓	CP-121-0493	5	2	1	1	1				✓	✓	
	4-12-93	1530		✓	CP-110-0493	6	2	1	1	1	1	1		✓	✓	
DW				✓	Trip Blank 6		2									

RELINQUISHED BY

SIGNATURE	DATE	TIME
Louis A. La Rosa	4/13	0810
J. Palmer	4-13	11:45A

RECEIVED BY

SIGNATURE	DATE	TIME
J. Palmer	4-13	9:45A
D. Pang	4/13	11:45

SHIPPING NOTES

LAB NOTES

BE-34 (1/92)

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

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RECEIVED

MAY 19 1993

Burlington Environmental Inc.
Technical Services

TRANSMITTAL MEMORANDUM

DATE: May 17, 1993

TO: David Broten, Burlington Environmental Engineering

PROJECT NAME: Pier 91

PROJECT NUMBER: 624878-7306

LABORATORY NUMBER: 31448

Enclosed are one original and one copy of the Tier II data deliverables package for Laboratory Work Order Number 31448. The samples were received for analysis at Sound Analytical Services, Inc., on April 15, 1993.

If there are any questions regarding this data package, please do not hesitate to call me at (206) 922-2310.

Sincerely,

Andrew J. Riddell

Andrew J. Riddell
Project Manager

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